

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Pennypacker's Portable Hoist.

We illustrate upon this page two forms of portable hoist by M. Pennypacker, of the Baldwin Locomotive Works, Philadelphia, Pa. Fig. 1 shows the form designed for traversing, suspended by wheels on a rail or beam. A side view with a section of the lower part is shown. In Fig. 2 we have a view of the portable form of the apparatus available for use at any point by means of a swivel hook at the top. The apparatus consists of a central box, affording bearings for a wheel carrying winding sheaves on its opposite sides, over which a double winding chain is made to operate. Through the direct attachment of the chain wheels, by means of clutches and a clamp bolt, shafts and keys are entirely dispensed with, and as the wheels are the only part liable to wear out, the repair of the machine is correspondingly facilitated. The use of double chain for heavy lifts precludes the necessity for using the large chains that are now required when it is the purpose to obtain strength of section. A double extent of wearing surface is likewise presented on the chain and sheaves, while the load is equally distributed on all its bearings, thereby reducing the friction to a minimum, preventing unequal and indirect wear and strains, and greatly increasing the strength and durability of the whole apparatus. Either of the two chains indicated is strong enough to sustain the load, and as they are independent of each other, more speed is attained than by the usual construction of differential hoists. They can be replaced by longer or shorter chains when required by simply removing them from the sheaves; and as the hand chain is independent of the lifting chain, it does not accumulate at foot as the weight is raised. The hoist will sustain its load at any desired point, but under no circumstances can it run down. It will lower rapidly as soon as started. The screw and wheel being encased in a tight box are kept free from dirt and dust, the former revolving in a chamber filled with oil. The mechanical efficacy of this hoist is such that one man can lift without difficulty 4000 pounds.

The apparatus as constructed with the swivel attachment is similar to that used as a traversing hoist, and is made in three sizes, for 2000 pound, 4000 pound and 6000 pound lifts. It can also be used from a low ceiling, as the hoist is shorter than those now generally employed, and the lifting hook travels up to the machine. It is a valuable feature, too, that either hoist can be applied and controlled at any angle, thereby enabling workmen to stand from under the ascending load.

The other advantages claimed for the apparatus are, that it is simple, strong and powerful, combining cheapness of construction with durability and efficiency. It is likewise easy to keep in repair, and perfectly safe to the workmen handling it.

"Old Colony" Iron Cutters.

The iron cutter illustrated upon this page presents many features of especial interest. The principle employed is that of Broadbroke's mechanical movement of the rolling wedge and the compound lever. The rolling wedge is between the cam-shaped lever and cutter head, and works in grooves or corrugations. Upon the lowering of the lever it is caused to move forward in the direction of the pivot, or fulcrum, and as the distance diminishes between the resistance and the fulcrum, the power, or leverage, is constantly increasing. This mechanical movement is one of enormous power, and on this account is very valuable in the production of a good iron cutting machine.

These machines are made in sizes varying from those intended to cut sheet metal and rods up to $\frac{1}{2}$ of an inch in diameter, up to those able to cut bar iron 3 inches wide by $\frac{1}{2}$ of an inch thick.

The No. 10 machine for cutting bar iron, is 14 inches long, 11 inches high and 5 inches wide, occupying but little space on a bench or block. Weight, 110 lbs. Lever handle, 3 feet long. It cuts readily iron up to $\frac{1}{2}$ inch thick and $\frac{3}{4}$ inches wide at one stroke of the lever, and also iron $\frac{1}{2}$ inch square, or steel $\frac{1}{2}$ by 1 inch. Two forms are illustrated; in each, however, the principles are the same.

In Fig. 1 there is a special arrangement for cutting off round iron which is omitted in the one shown in Fig. 2. The latter machine is designed for smaller and lighter work than the other. In both cases the frames and levers are of cast steel, very neat in design and very strong. The castings themselves seem to be exceptionally fine. The cutters are secured by screws, so that they can be easily replaced or taken out for grinding. The arm by which the two levers are connected has various notches for the purpose of adjustment, so that when a small piece of iron is to be the lever it can be reduced, and the work done more rapidly than would be possible were the same speed and opening of jaw used for all sizes and kinds of metal. In Fig. 2 a small strap will be observed upon the cutting jaw, this holds the rolling wedge in place. These

iron cutters are manufactured by the Old Colony Rivet Works, New York warehouse, 34 Warren street. It may not be out of place to say that the prices of these machines are exceedingly low, a No. 3 machine, capable of cutting 5-16 in. diameter sheet metal, costing but \$20.

The Brooklyn Bridge.

Chief Engineer Roebling has presented his annual report to the trustees. The following were the principal facts: The small quantity

the cable itself emerging eight feet below the top of the masonry. In all previous wire bridges each cable was composed of seven strands. In this they contain nineteen, requiring thirty-eight bars for their attachment. These bars are of iron, as preferable to steel for such a use. Investigations at the Pittsburgh and Niagara bridges have shown that the old style of preserving the chains is safe, viz.: painting the chemically-cleaned surface of the iron and then imbedding the chain in hydraulic cement. The rusting power of Brooklyn air is twenty fold that of Cincinnati. The main cables are

eru Iron Boatbuilding Company's Works, in South St. Louis, formerly of New York city, undertook the construction of a railroad car exclusively of iron. The car is an ordinary platform or flat car, and was built more as an experiment than anything else. It is thirty feet long and nine feet wide, and built entirely of iron, with the exception of the flooring, which is of $1\frac{1}{4}$ inch oak planks. It is of a very neat shape, with slightly curved sides and round corners. The body as well as the truck frames are of wrought iron, and so constructed as to convince one of its strength as well as its durability.

A young woman suddenly flounces in her seat and throws up her arms, and exclaims to her fellow travelers, through a companion:

"Did you ever know anything so hot? I'm stifling. Can't you open this window? Whew! whew! O dear! it's dreadful, isn't it? It's always so in these cars. My! It's awful!"

On one occasion, when this kind of remark had been made at some length for the edification of the company, a voice was heard from the other end of the car: "Yes'm, it's awful. But let's try to bear up. 'Tain't nothin' to the sufferin's of the early Christians." A general laugh followed and nothing further was heard from that young woman."

Hardware and Iron at San Francisco.

The *Commercial Herald*, of San Francisco, in its annual review of the trade of that city, says concerning hardware, iron and steel:

We had occasion in our last two annual reviews to speak of the hardware trade in rather discouraging terms, the excessive importations of previous years, a constantly declining market, the numerous failures, and the low and unremunerative prices—all having conspired to produce unusual depression in the ranks. Some of these elements have been felt, though in a lesser degree, during the past year, but the general result for the year's business will be far more satisfactory to all concerned than either of its predecessors. The volume of business transacted has been larger, some of the leading houses having sold more goods in a single month than in any three in previous years. The profits, although light and cut down to a very small margin, have yet been an improvement in this respect, that the business has been less disturbed by sharp declines in the East, and a greater discrimination exercised in granting credits, producing a corresponding increase in profits. The numerous failures in the ranks, and the extinction of old established houses thereby, have had the effect of making the rest of the trade more conservative, and of attending more strictly to their own legitimate business while shunning outside investments, and the days when a greenhorn could hoist his shingle in the backwoods, come to an end. Collections are made much closer than ever before, and country buyers who want ninety days and take four months are not sought after with avidity. This is one of the results of the trade settling into the hands of practical hardware men who understand their business and attend to it. With a few exceptions, prices have ruled steady during the year. Nails opened at \$4 rates, sold as low as \$3.25, and closed firm at \$3.75, with very light stock on hand and on the way. Imports for the year were 170,000 kegs as compared with 227,915 kegs in 1873 and 214,994 kegs in 1874. The number of kegs on the way at the opening of the year was 59,345, and the amount at present will not exceed 8000 kegs, the quantity on hand at date being less than for many years past. The Parker Mills, of Wareham, Mass., have been shut down most of the year, thereby causing a scarcity of this favorite brand, and giving the Western nail manufacturers a firm footing in the market. Screws have not been a profitable article of merchandise, the discount having ranged all the way from 40 to 60 per cent, closing at 50 per cent. The list on locks underwent a remodeling, making common rim and mortise locks about 15 per cent. cheaper, and the better grades of mortise locks about 10 per cent. higher. Planes, hammers, chisels and most kinds of carpenters' tools have declined from 5 to 10 per cent. We noted last year the introduction of Leland's axe, pick and sledge handles. The demand during the season was very satisfactory, the agent reporting sales of some 2000 dozen axe and 1000 dozen assorted. In the line of small tacks, nails, &c., we note a decided inroad made by Hobart's goods, which for years have been the standard in the shoe-finder's business, but have only recently been sold by the hardware trade. We noted in our last review that the well known house of Pilsbury, Webb & Co. were closing out. Just before the new year the business was purchased by James E. Gordon, for nearly 15 years head salesman with Linforth, Kellogg & Co., and their predecessors, L. B. Benckley & Co., and well and favorably known to the trade. The old firm of Thomas H. Selby & Co. has been reorganized, and will be continued under the same firm name. Van Winkle & Davenport have dissolved and are succeeded by I. S. Van Winkle & Co. The last two firms, although classed as hardware, are more particularly dealers in iron and steel. The price of bar iron has been well sustained during the year, owing to the combination. This, however, having been broken in December, the price is now open and is ruling at about 3 cent rates. The combination netted the trade a handsome profit, which from now on will be lost. The outlook for 1877 is rather discouraging, there having been no rain during November and December; but notwithstanding we hear of stock orders fully up to the average having been placed for spring trade.

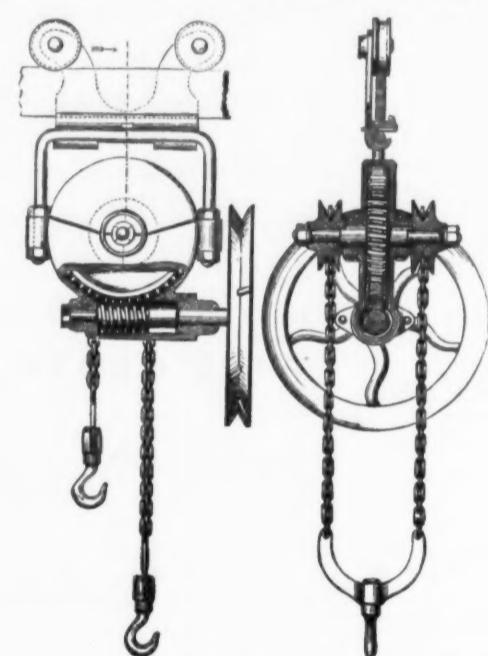


Fig. 1.

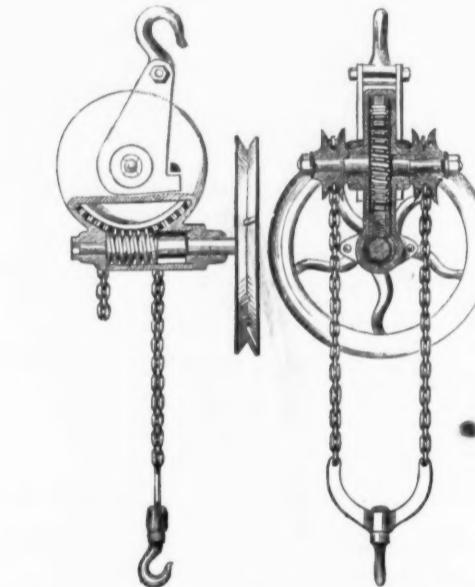


Fig. 2.



Fig. 1.



Fig. 2.

the Brooklyn tower were completed in the spring of 1874. The keystones, blocks weighing eleven tons, were fitted in without trimming, which showed great accuracy of measurement at the quarry and in the adjustment of the joints. On the completion of the tower the saddle and saddle-plates, which are twice as heavy as those at Cincinnati, were raised and put in place without accident. The resistance offered by the weight of the masonry on the plates against the upward pull of the chains affords a margin of safety of two and one-half times. This figure seems small compared with those of the main cables, where the margin of safety is about six times. But in the anchorage only two factors have to be considered—granite and gravity. The anchor chains are so disposed as to form the quadrant of a circle from a point of 20 feet above the anchor-plate to within 25 feet of the front of the anchorage,

and test the carrying capacity of the car. It weighed without the brakes, 14,850 pounds, and with the brakes it is calculated to weigh about 15,000 pounds. It was deferred testing the carrying capacity of the car until the brakes could be applied, or until a day or two, when the car will be loaded with steel rails from the Bessemer Steel Works, and sent out over the Missouri Pacific Road. The gentlemen who viewed the iron car appeared much pleased with its construction, and expressed themselves in a manner which would indicate that the experiment so far was a decided success. Many of the railroad officials of St. Louis have awaited the construction of this car with decided interest, and iron cars are speedily expected to take the place of wooden ones.

Iron Railroad Cars.—From the *Globe-Democrat* we learn that a few weeks ago Mr. Theodore Allen, superintendent of the West-

ern Railroad Cars, told this story: "I have been testing the carrying capacity of the car. It weighed without the brakes, 14,850 pounds, and with the brakes it is calculated to weigh about 15,000 pounds. It was deferred testing the carrying capacity of the car until the brakes could be applied, or until a day or two, when the car will be loaded with steel rails from the Bessemer Steel Works, and sent out over the Missouri Pacific Road. The gentlemen who viewed the iron car appeared much pleased with its construction, and expressed themselves in a manner which would indicate that the experiment so far was a decided success. Many of the railroad officials of St. Louis have awaited the construction of this car with decided interest, and iron cars are speedily expected to take the place of wooden ones.

Martyrdom.—Mr. George William Curtis, talking of railway manners, tells this story:

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SEE PAGE 9.

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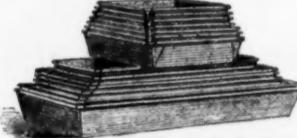
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FACTORIES, Jeffersonville, IND., Camp Washington, O.

Dr. Nott's Heating Stove.

Our illustration shows a form of heating stove invented by Dr. Nott, of Union College, Schenectady, N. Y. The original of our illustration is still in use in the college and does good service. In this city (New York) there are a considerable number of them in private houses, apparently as satisfactory in their action as when they were put up, perhaps 40 years ago. The illustration represents one of the largest kinds, which, if we remember rightly, was called the Statue Flue, from the statuette which was placed in the arch between the flues. From the floor to the top of the stove was something like 8 feet or more, and the weight was something enormous, six or seven men being required to handle such a stove even when the flues were separated from the fire-box, as they had to be when the stove was moved.

The body of the stove was a square iron box lined with heavy fire-brick. At the bottom of this box is a semi-cylindrical grate with the bars running around it. When turned upside down the fire was dumped as in the modern form of grate. The draught was not directly up through the coal, but across the bottom of the fire to a flue upon the back side separated from the fire-box by what was called a flue brick. Coal was fed into the stove by raising one of the flat oblong covers seen on the top of the fire-box.

The products



DR. NOTT'S HEATING STOVE.

your issue of this morning from the Troy Times, in respect to the "anti-clinker" question, are not based upon the truth.

First. The suit commenced against us is not for \$100,000, or any other fixed sum. The amount, if anything, can only be ascertained at the end of a decree and an accounting.

Second. It is not true that "James Spear, of Philadelphia, conceived a plan several years ago for the manufacture of a stove grate, the peculiar feature of which was its 'anti-clinker' property;" but, on the contrary, it is true that Spear copied this construction from prior inventions which belong to us, and then claimed it as his own.

Third. It is not true that "Elihu Smith, about the same time, invented an apparatus whereby a sub-base flue system was introduced;" that system had been in public use for fifty years or more previous thereto.

Fourth. Neither is it true that "some of the manufacturers, seeing the value of the combination, entered into an association for the protection of the patents which they purchased from Spear," * * * for the simple reason that the association was formed November 18, 1874, while the Spear patents were purchased by us two years later, viz., November 16, 1876.

Fifth. It is, however, true that several of the manufacturers, seeing the value of the inventions and improvements belonging exclusively to us, and which were embraced in the Argand base burner, brought out in 1873, soon after constructed new patterns in imitation of the same, and in November, 1874, formed a combination for the primary purpose of defeating our application for patent for these inventions and improvements, in which, after squandering some \$50,000, they were utterly defeated. It is this same powerful combination that is now seeking to deprive us of our rights by virtue of concentrated capital and influence.

Sixth. It is also true that there are many persons who do not recognize the claims of the patentees as the original inventors of the apparatus," and for that reason, some days since, and prior to the commencement of the suit against us, we instituted legal proceedings under four foundation patents, issued in 1865, 1866, 1867 and 1876 respectively, against a stove manufactured by one of this league, and known as the "Grown Jewel."

The decision in this suit will determine the liability to us of some 200 manufacturers, who are openly and defiantly infringing our patents.

The pith of the whole matter, and the secret of the formation of the league, and the institution of the proceedings against us, lie in the wonderful success of the Argand base burner, whose advent upon the market rendered valueless every other base burning stove. The manufacturers felt compelled to use our inventions and improvements, and they do not want to pay anything for the right.

PERRY & CO.

ALBANY, Jan. 19, 1877.

The Reading Coal and Iron Company.

The Daily Bulletin of this city publishes the following: On the 30th of November, 1869, the first year of the present management, the company stood as follows:

Stock and bonded liabilities.....	\$96,842,692
No coal and iron company in existence.....	2,976,919
Dividend fund of 1869.....	4,101,548
No floating debt.....	0
Coal transported over main line and lateral.....	1,770,533
Of which went to Port Richmond for shipment.....	3,369,972

On the 30th of November, 1876, the balance sheets of the two companies give the following result:

Stock and bonded liabilities of the railroad company.....	\$105,461,585
Stock and bonded liabilities of the coal and iron company.....	63,466,007
The result of the business of the last fiscal year are:	
Loss of the railroad company.....	\$1,861,947
Loss of the coal and iron company.....	653,359
The floating debt of both companies will stand on April 1st, next, at.....	8,972,359
Coal transported over main line and lateral.....	4,139,184
Of which went to Port Richmond for shipment.....	1,770,533

On \$48,718,000 due by the coal and iron company to the railroad company no interest is charged to the coal and iron company, and the report tells us none need be paid upon it; but it is evident that the railroad company, which lent its own credit to raise that money, has to earn the interest on it as well as the interest on \$15,728,041 due of the liabilities of the coal and iron company held by the public and guaranteed by the railroad company if the coal and iron company cannot earn it.

The above formidable figures give us the whole story in a nutshell.

Well may the managers exclaim when alighting to the coal lands, no such estate has ever been created. We entirely agree with them.

It is but little over five years since the purchase of coal and iron lands began. The coal lands, we are told, contain over one-third of the whole amount of anthracite known, and they do not produce last year one-sixth of the anthracite sent to the market. We are also told that a very small proportion of the entire estate of the coal and iron company is as yet improved. That proportion, however, is the most available and least expensive to improve, and yet after spending on their own coal lands in colliery improvements, \$6,155,398; in colliery equipments, \$806,617; in deal work at collieries, \$453,538, and charging it to capital account, fixing arbitrarily for nearly four years a price for coal far above its market value

Iron.	Iron.	Iron.	Iron.	Iron.
NEW YORK.	NEW YORK.	NEW YORK.	NEW YORK.	NEW YORK.
OGDEN & WALLACE, Successors to GAM'L G. SMITH & CO. IRON & STEEL, 85, 87, 89 & 91 ELM ST., N. Y. COMMON AND REFINED BAR IRON. SHEET AND PLATE IRON, HOOP, HAND AND SCROLL IRON, Rod and Horse Shoe Iron, Angle and T Iron, Swedes and Norway Iron, Norway Nail Rods. Iron of all sizes and shapes made to order.	G. HUERSTEL, IRON and STEEL. Warehouse, 99 Market Slip, N. Y. Branch Store at 313 E. 23d St., 5 doors east of 8d Ave. IRON AND STEEL OF ALL KINDS Constantly on hand. Horse Shoe Iron and Nails, Norway Iron, Cast Spring, Toe Calk, and Bessemer Steel Tire. Also, SPRINGS, AXLES AND BOLTS, For Truck and Carriage Makers.	T. D. HAZARD, BROKER IN NEW & OLD RAILS. Foreign and Domestic PIG IRON, Wrought and Cast Scrap Iron AND GENERAL METALS. 204 Pearl St., New York.	HARRISON & GILLOON IRON AND METAL DEALERS, 568, 560, 562 WATER ST., and 302, 304, 306 CHERRY ST., NEW YORK, have on hand, and offer for sale, the following: Scotch and American Pig Iron, Wrought, Cast and Machinery, Scrap Iron, Car-Wheels, Axles and Heavy Wrought Iron, also old Copper, Composition, Brass, Lead, Pewter, Zinc, &c.	PITTSBURGH. PENNSYLVANIA IRON WORKS. EVERSON, MACRUM & CO. Pittsburgh, Pa., Manufacturers of every description of Bar, Sheet and Small Iron, make a specialty in Fine and Common Sheet Iron.
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WM. MARTIN, HUGH LESLIE,

THOS. GANNON, THOS. HAMMOND.

and patronage of all furnace men.

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Remove Chills, Salamanders, or Scaffolding from Blast Furnaces,
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trade solicited.For circulars and terms, ad-
dress,W. F. HYATT,
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280 PEARL ST., NEW YORK.

New Patents.

We take from the records of the Patent Office
at Washington the following specifications of
certain patents, lately issued, which will be
found interesting:IMPROVEMENT IN CONSTRUCTION AND PROTEC-
TION OF PUDDLING FURNACES.Specification forming part of Letters Patent
No. 181,975, dated September 5, 1876, issued to
James Pedley, of Pittsburgh, Pa.

Fig. 1 is a side elevation, partly sectional.

Fig. 2 is a section of floor.

This invention has relation to puddling furnaces, and consists, first, in dividing the fire chamber from the combustion chamber by means of a hanging bridge, and in providing air chambers, which extend upwardly and backwardly through the furnace roof and open into the combustion chamber immediately above the bridge; secondly, in the combination, with a flanged door casting, of a detachable fire-clay lining, which is bolted to the door casting, and provided with nipples, which separate the adjacent surfaces of the two—all as herein-after described.

IMPROVEMENT IN METALLURGIC FURNACES.

Specification forming part of Letters Patent
No. 179,072, dated June 20, 1876, issued to
William Silvester and Henry Kirk, of Pitts-

burgh, Pa.

This invention relates to an improvement in

metallurgic furnaces, and consists in the com-

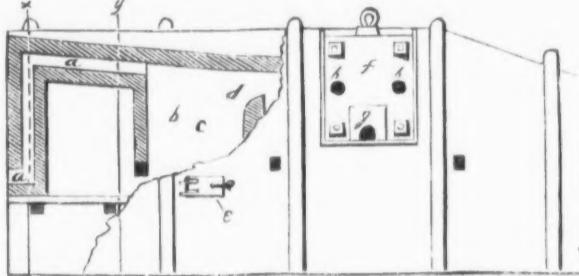
bination of a combustion chamber, air cham-

ber, fire chamber, air heating flue, and bridge

walls, arranged and operating with relation to

each other substantially in the manner herein-

after described.



IMPROVEMENT IN CONSTRUCTION OF PUDDLING FURNACES.—Fig. 1.

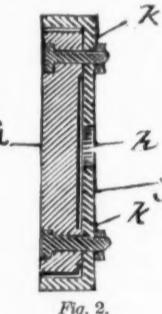
The accompanying drawing is a side elevation
of the improvement in furnaces.Referring to the drawing, A represents the
fire chamber of the furnace, provided with a
supply hopper, l, furnished with a valve with a
lever, through which the fuel is fed to the fire
chamber. B is a flue leading from the fire
chamber, through which the products of com-
bustion are conveyed into the gas chamber C.
D is an air chamber, placed over the gas chamber,
which communicates with a system of hot
air flues, through the openings t, hereafter de-
scribed. E is the working chamber. Air flues
communicate with the chamber K, which com-
municates with the air duct s through the open-
ing 8, and this latter communicates with side
flues in the walls of the furnace that lead to
the chamber K and the hot air chamber D,
communicating with the latter by means of
the openings t. F and G are bridge walls. The
hot air chamber D is provided with anadjustable gate x, by which the opening lead-
ing to the working chamber for the passage of
the hot air can be increased or diminished.As in the process of puddling, it is a matter
of great importance to have some means

Fig. 2.

of suddenly cooling and then suddenly heating
the metal, dampers are used generally,
but are not fully effective in point of time. A
door or adjustable regulator e is provided to
the gas chamber c. When the operator wishes
to cool his metal suddenly, he has only to
open the regulator e, which, by the draft, in-
stantly sends in large volumes of cold air, in-
stantly reducing the heat without interfering
with the draft. Then, when he wishes to heat
again, everything is ready, the hot air entering,
and the fuel burning briskly, and the draft on,
and all he has to do is to close the regulator e,
and the white heat is produced at once.
These effects may be modified by opening the
regulator e to a greater or less extent.The intense heat produced in these furnaces
makes a fire-clay door a necessity. This is
usually made of a cast iron casing, the inside
of which is built up of fire bricks. But the
heat melts away the bricks or warps them so
that they fall out and expose the iron, which
in turn falls a prey to the heat. Hence, doors
are a considerable expense, as they last but a
short time. The door is constructed as fol-
lows: Take the usual casting f and rabbet-
bit g, but cut in the casting bolt holes at the
four corners, and one or more cold air ports
h, in the face of the casting. Then take a
solid block of fire-clay i of the shape shown,
which will nearly, but not quite, fill the hol-
low portion of the casting f, leaving an air
space on the edges. By means of the teats k
on the block i (or these projections may be on
the casting, or the same effect produced by
washers), keep the block from touching the
casting except at the bolt holes. Then the
bolts are passed through and nuts turned down
to tighten the whole. The bolt holes are coun-
tersunk on the inner face of the block. Thus
constructed air surrounds the block, and the
draft of the furnace keeps the air space con-
stantly filled with cold air, thus keeping the
casting comparatively cool. The casting will
last a long time thus, and the fire clay block
lining being in one piece does not crumble
away and melt so rapidly as when made of
a number of blocks fitted in.The grate r, the stack m and the charging
door are all of ordinary construction.

The operation of the invention is as follows:

The exterior air enters the flues, is conveyed
into the chamber k, and from thence passes
through the opening s into the duct t. From
here it is deflected by the deflector into the
side flues through openings, and by these flues
it is conveyed to the chamber k and hot air
chamber D.The air as it passes in proximity to the fire
is increased in temperature, and in its pas-

sage through the duct t and flues

absorbs heat from the walls of the furnace,

and when it reaches the place where it enters

the chamber D, its temperature is quite high,

sufficiently so to support the combustion of

the gases. The hot air passes from the cham-

ber D, induced by the draft of the furnace, and

comes in contact with the products of combus-

tion, which passes from the gas chamber C un-

der the hanging bridge wall F, in the direc-

tion of the arrow, and at the point of contact

the intense heat of the air produces a perfect

combustion of the gases and other unconsumed

residuals from the fire chamber, and a clear white

flame passes over the bridge wall G into the

working chamber, possessing an intense reduc-

ing power.

Claim.—1. In a metallurgic furnace, the com-

bination of the induct flues, the chamber k,

the return side flues and air chamber

D, with the fire chamber and working cham-

ber.

2. In a puddling furnace having the

combustion chamber c, terminated by the

bridge d, and divided from the fire chamber
by means of the hanging bridge b, the combi-
nation with said combustion chamber of the
air flues a, extending upward and backward
through the roof of the furnace, and opening
into the combustion chamber immediately
above the bridge b.2. The combination, with the flanged door
casting f, of the detachable fire-clay lining i
bolted thereto, but separated from contact
therewith by a space around its edges.3. The combination, with the door casting
f, of the detachable fire-clay lining i, having
the nipples k to separate the adjacent surfaces.IMPROVEMENT IN BATHS FOR TEMPERING AR-
TICLES OF IRON

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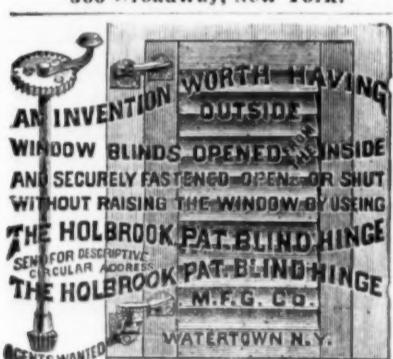
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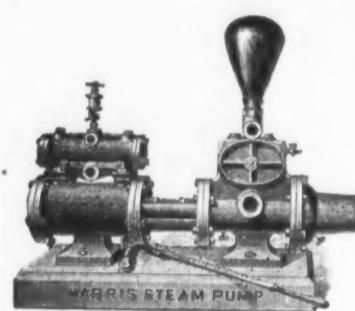
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Drilling Machines.

The following paper was read by Professor J. E. Sweet before the Mechanical Engineering Association of Cornell University:

Even in the construction of what appears so simple a thing as the drilling machine, there has been a deal of thought expended upon it already, and likely to be much more. A large per cent. of this additional thought will be in making alterations and the remainder in improvements. The lever drill, or, more properly, the lever drilling machine, is only used for small work and now almost wholly confined to manufacturers in which they have a large number of small holes to drill. The general form is an upright standard, either supported upon a base plate resting upon the floor or upon a low stand, sometimes made in the form of a basin to catch the chips and oil. The post supports the drill spindle in a vertical position, a horizontal shaft and driving pulley, similar to our post drilling machine, and the two shafts are geared together with a miter gear, giving the spindle a more rapid motion with the same speed of belt than that on the post drill. In all the lever drills with which I am familiar the work is fed up to the drill instead of the drill being fed down to the work; this, for all small work, answers every purpose, though the machine for jobbing purposes would be far more serviceable if the drill was fed to the work. The advantages of the lever drill for small work are small first cost, quick action and the fact that the workmen can feel the working of the drill, and nearly one-half more work can be done than is usually done by the screw power machine. I have known a boy 15 or 16 years old drill 80 knife bars $\frac{1}{4}$ inch thick, each having about 40 holes $\frac{3}{16}$ inches of an inch in diameter, in one day. It would be drilling a 3-16th hole equal to about 66 feet deep; and over 5 holes a minute, $\frac{1}{4}$ inch deep, all day long. I know of no other machine that could approach it. To make the machine so the spindle will have 3 or 4 inches vertical motion and the table adjustable, will not detract from the present advantages of the machine, but will render it available for all kinds of work within its range.

Post drilling machines, such as the one in our shop, are made of various sizes, and ours is one of the smallest I have ever seen. Wm. B. Bement & Son, of Philadelphia, build them with a column as large as twelve inches in diameter. As a general thing, the machines built by Eastern makers have a close resemblance to each other, while each of the leading Philadelphia firms build machines characteristically different. All except Sellers, I believe, use the round post, around which the table can be swung, to allow for adjustment, or turned out of the way altogether, so that work can be rested upon the base plate. In the English practice, the table has an in and out, and a transverse slide, as well as the vertical motion, all worked by screws; but this is more costly and less satisfactory than the American practice. In the Sellers machine, the in and out slide is hinged to the vertical slide, so the table may be swung out of the way. The requirements are a table which can be raised and lowered at will; it is convenient to have it adjustable by screw motion rather than by a ratchet, for with a heavy piece, one end resting on blocking, the screw motion is better for leveling up than the ratchet device; a worm gear fills the bill. While it is better to have the table swing by positive movements, it is an advantage if the swinging table is arranged so as to rise and fall without being free to turn on the post. One advantage to be derived is that when a center is fitted in the center of a table, as in ours, though it is one great convenience not commonly applied; then, when the center is once set to coincide with the point of the drill, the table can be raised and lowered, still keeping the centers in line. There are two methods employed for the traveling spindle, one with a sliding head, as ours, which is certainly a fair sample, if not one of the best of the Eastern make; when such a sliding head is used, it should be perfectly counterbalanced, so the weight will never need any adjustment or ever be in the way. It is a good plan to have a chain which will not break every day. The other plan is where the spindle travels through the head and has a counter-weight attached to its upper end. This plan has one great advantage, that is, there is no loss motion. When the point of the drill strikes the work it is ready to begin to drill; whereas in those machines on the plan of ours, there are three or four places for lost motion which must be taken up before the pressure can be put on. This, however, is not of so much importance as that arising from the lost motion when the drill begins to come through the work; then when the drill has almost completed its work, the lost motion allows the drill spindle to drop and the drill to catch in the unfinished hole. From this, cause more drills get broken than from any other.

None of you, except those who have worked without it, can half appreciate the advantage of Mr. Moler's little device for indicating the depth of the hole. With the exception of a comparatively costly device fitted to the Pratt & Whitney machine, I have seen nothing of the kind, and this, I believe, to be the first and best. The spindle of the post drills are driven with bevel gears and right angle belts. All large machines have back gearing the same as lathes, so that a 4-foot cone pulley gives 8 speeds to the spindle.

A writer, reporting on machine tools at the Exhibition for Engineering, questions the value of quick return motions—that is, whether it is worth while to arrange the machine so that by throwing out the screw feed the drill can be quickly withdrawn rather than to withdraw it by turning the crank wheel backward. While we agree in so many things, I disagree with him in this. For all small drills the lever feed can be used without throwing the worm into gear at all, and then you have the advantage of

the lever machine—that is, you can feel the cut of the drill, and know without waiting to hear it squeak or see it break, whether it is doing its work or not. I will not linger to describe the girder drill, as you will be likely to have the chance to learn all about one before you have an opportunity to use it.

The radial drilling machine is of comparatively modern invention and has been already twisted into a variety of shapes. It consists, as generally constructed, of a column carrying at its top a boom, the boom having a silling head which carries the drill spindle. The boom being free to turn around the column and the head to slide out and in, the drill can be adjusted to any point. That is, if the cylinder of an ordinary engine be secured or rested upon the bed plate of the machine, the drill can be brought in position to drill the various holes without moving the casting. These machines have been built so that the boom could be turned upon its horizontal axis, and also so the drill spindle could be turned to or from the column, thus enabling the machine to drill at any angle as well as in any position; but the policy of these additional features is very questionable. The chances that a drill will ever be used in that position are so slim that it will not pay unless the machine is built for a special purpose when known that such a thing is wanted. All radial drilling machines and all the large post drilling machines are usually fitted with an automatic feed motion, but it is often left to rust than used, except in shops where one man is kept to run the machine. There cannot then be much economy in it, for while the drill is working, the workman has nothing to do; and if he is feeding his drill, he is not likely to be fooling around.

In the ordinary practice of drilling it is customary to locate the center of the hole and make a small indentation with a center punch; then to strike a circle with the compass the size of the hole to be drilled, and to firmly fix the location in case the circle gets obliterated; four center punch marks are made on the four sides of the circle, so that in starting the drill, if it does not start truly central, as they seldom do, the four marks will indicate the direction in which it is out of its proper place. It is also customary, when starting the drill, to examine carefully to see that it is starting true, or if it draws to one side to chip out with a round nose chipping chisel on that side, so as to bring the drill back central. I do not think this the best way—at least, the best for only those who have worked that way for years. When a man has followed one practice, and has become an expert at it, then a new way must be a very superior one to make it to his interest to change; but with you who have two ways put before you, neither of which are you familiar with, then I think the plan of drilling a small hole as quick and more certain of success. If the indentation of the center punch be as large as the small drill, then the small drill cannot be started anywhere except in the right place; and if the small drill be about as large as the thickness of the point of the large drill then the large drill hole will follow the small one to a certainty, if there are no flaws or blow holes in the metal, and they are hard to fight against in any case. The use of the small drill, and then the larger one, calls for a change of speed in the machine. To overcome this objection, I have thought of making a drill chuck within itself a speed gear which will give the drill a speed eight or ten times faster than the speed of the spindle of the machine, then by simply changing chucks the small drill will have the proper speed when the machine is set at the proper speed for the large one. The nature of the mechanism to accomplish this is only a planetary gear, the same as the back gear of our lathe, made on a small scale. Another improvement that can be made on drilling machines is some better method of securing chucks; the present method is too slow; some modification of the bayonet fastening is the thing.

One of the most destructive things going on in our shop is the destruction of small drills, and though I do not expect you to learn how strong, or rather how weak, the drills are until you have broken some, still the observance of two things will save a great many, and you will learn just as fast. If you wish to drill a hole only one-fourth of an inch deep, set the drill in the chuck so that it projects only about 5-16ths of an inch; then if you break it there will be a short piece gone. See that the drill is sharp; keep it oiled and feed carefully; not specially slow when it is cutting nicely; but if it does not cut clear, do not force it; when your drill is coming through the piece be careful; hold the piece back so it cannot run on to the drill.

Coral is a stony or calcareous formation, being in fact the agglomerated shells or frame work of creatures invisible to the unaided eye, and it is found in almost every degree of latitude and longitude. It is infinitely variable in its form and characteristics. Linnaeus, the great Swedish naturalist, assigned it a place intermediary between the animal and vegetable kingdom. It was not until the sixteenth century that it came to be regarded in any other light than that of a marine plant, devoid of all animal life. It is known to produce eggs and to give birth to living young, and it is also propagated by a process of budding analogous to that seen in plants. These characteristics have been discovered solely through the aid of the microscope, and are the results of modern investigation. Owing to its infinite variety of form and dimension, as well as its vast constructive capacity, as displayed in the formation of reefs, islands, and even continents, this minute organism has ever possessed for those of a scientific cast of mind an interest of the most absorbing nature.

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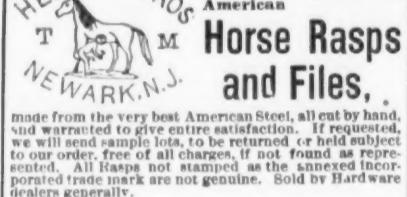
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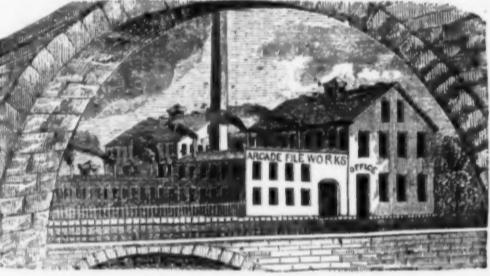
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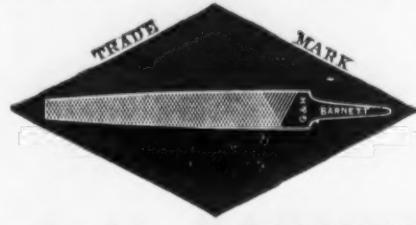
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St. Louis, Mo., SEMPLE & BIRGE MFG. CO., Agents.

THOS. TAYLOR, 43 Chambers St., N. Y., Agent for N. Y. and N. E. States.

THOS. JOWITT & SONS, SHEFFIELD,

Manufacturers of every description of

FILES.

Forged, Ground and Cut by
Hand and Tempered by an
Improved Process.

Manufacturers of
CAST, SHEAR & BLISTER
STEEL

For various purposes.

Granted according to Act of Parliament, and Registered in Germany and the United States.

AGENTS:

Messrs. Russell & Erwin Mfg. Co.,

New York and Philadelphia.

Messrs. Huntington, Hopkins & Co.,
San Francisco and Sacramento.Messrs. Quackenbush, Townsend & Co.,
New York.Messrs. Frothingham & Workman,
Montreal.ROLLERS, TILTHERS &
FORGERS.Importers of
SWEDISH and RUSSIAN
IRONS.CHARLES B. PAUL,
FILES.Manufacturer of
HAND-CUT

CAST STEEL.

187 Tenth Street, Williamsburg, New York.

Established 1863.

AUSABLE HORSE NAILS
POLISHED OR BLUED.
HAMMERED AND FINISHED

The Ausable Nails

Are Hammered Hot,
And the Finishing and Pointing are
Done Cold,

Thus Imitating the Process of Making Nails by Hand.

Quality is Fully Guaranteed.

For Sale by all Leading Iron and Hardware Houses.

ABRAHAM BUSSING, Secretary,
35 Chambers St., New York.NORTHWESTERN
HORSE NAIL CO.

ESTABLISHED IN 1862.

HAMMERED AND FINISHED HORSE NAILS.

We offer our Finished Nail to the trade with the
confidence that it has no equal in the market. It is the
genuine "Northwestern" Nail, Finished, and we give it our
unqualified guarantee.

Office and Factory, 56 to 68 Van Buren St., Chicago.

A. W. KINGSLAND, Secretary.

GLOBE NAIL COMPANY,

MANUFACTURERS OF

Pointed Polished & Finished Horse Shoe Nails.

Recommended by over 20,000 Horse Shoers.

All nails made from best NORWAY IRON, and warranted perfect and
ready for driving. Orders filled promptly and at lowest rates by

GLOBE NAIL CO., Boston, Mass.

Hoisting Machinery
Manufactured by
Crane Bros. Mfg. Co.,
CHICAGO.
COOKE & REGGS, Agents, 16 Cortlandt
Street, New York.

New Illustrated
Catalogue and Price List of
Our
SCALES
AND
SPRING BALANCES,
is now Ready and will be sent to the
trade, on application to
John Chatillon & Sons,
91 & 93 CHURCH ST.,
NEW YORK.

PRIZE MEDALLISTS:

London, 1862; Oporto, 1865; Dublin, 1865; Paris, 1867; Moscow, 1872; Vienna, 1873, and **Highest Award and Medal at Centennial Exhibition, Philadelphia, 1876.**

CLARK & CO.,

Original Inventors and Patentees

OF

Noiseless Self-Coiling Revolving
STEEL SHUTTERS,
FIRE AND BURGLAR PROOF.

Also Improved

Rolling Wood Shutters

Of various kinds. Clark's Shutters are the **Best** and **Cheapest** in the world. Are fitted to new Tribune Building, Lenox Library, Delaware and Hudson Canal Co.'s Building, Transatlantic Steamship Co.'s new Dock, American News Office, &c., Posey County Court House, Marion, Indiana, Howard County, Oregon, Mass., Also to buildings in Boston, Cincinnati, Detroit, Janesville, Wis., Baltimore, Canada, &c. Have been for years in daily use in every principal city throughout Europe, and are endorsed by the **Leading Architects of the World.**

Office and Manufactory,

162 & 164 West 27th Street, N. Y.



TRADE MARK, PATENTED.

PRINCE'S METALLIC PAINT,
AN INDESTRUCTIBLE COATING FOR
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PRINCE'S METALLIC PAINT CO.,
Manufacturers,

225 Pearl Street, New York.
Caution.—As certain parties are offering for sale a SPURIOUS PAINT, under an imitation name, purchasers will please see that our TRADE-MARK is on every package. **None other genuine.**

C. C. Harlow & Co.,
BRIDGEWATER, MASS.,
Manufacturers of

DAMAN
Standard Hollow Augers,
Universally acknowledged superior to any other in the market. They have recently been improved, making them, as now offered to the trade, the most perfect tools of their kind, either in design, material or workmanship.

Spoke & Dowel Trimmers
The very best as well as cheapest.

Metallic Combination Plow Plane,
Made of solid cast steel and of gun metal. Of an entirely new design. Can be used as Groover, Dado, and Rabbet Plane, in any direction of the grain, and also as a Match Plane.

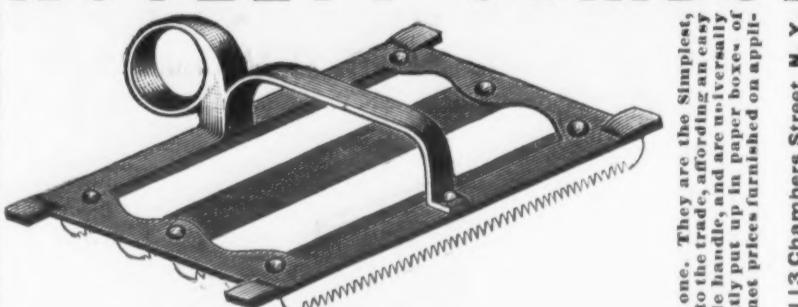
Common Sense Door Spring.
The most durable and cheapest Door Spring yet made.

LEAD PIPE CUTTERS.
To cut lead pipe in any position and without chips or burrs.

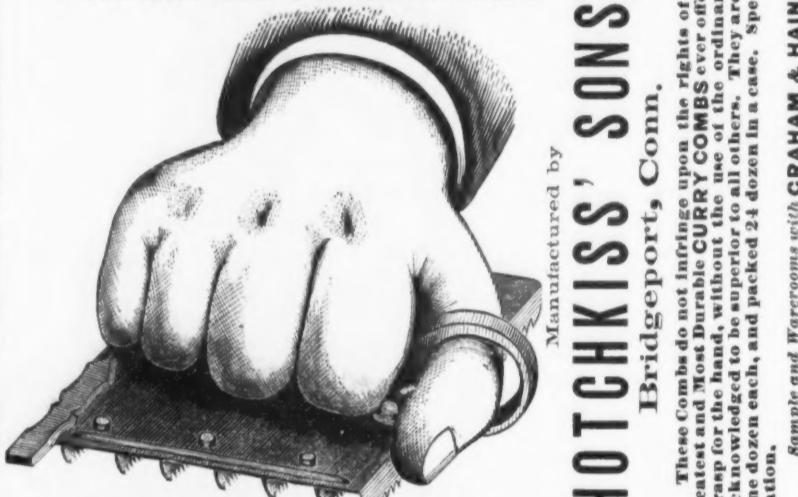
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The Sugar Maker's Friend.
Agents wanted
in every Sugar
District to carry
on the sale of
Post's Patent Metallic Eureka Sap
Spout and Sucker Hanger. Samples,
Circulars and Terms sent postpaid
on receipt of 20 cents. Address
C. C. POST, Manufacturer & Patentee, Burlington, Vt.

HOTCHKISS' PATENT NOVELTY COMBS.



THIS CUT ILLUSTRATES THE GRASPING OF THE COMB.



Manufactured by
HOTCHKISS' SONS,

Bridgeport, Conn.

These Combs do not infringe upon the rights of any one. They are the simplest, Neatest and Most Durable CURRY COMBS ever offered to the trade, affording an easy grasp for the hands, without the use of the ordinary side handle, and are universally acknowledged to be superior to all others. They are neatly put up in paper boxes of one dozen each, and packed 24 dozen in a case. Special net prices furnished on application.

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Coyne's patent nail picker is to be put in the nail machines at Kimberly, Carres & Co.'s, Sharon.

The National Locomotive Works, at Connellsville, have a full force on and a number of engines under construction.

The Baldwin Locomotive Works, Philadelphia, recently delivered a new engine to the Union Railway and Transit Company, of St. Louis, for service on the bridge.

The Phoenixville Iron Company have received an order for the erection of the huge structure known as the "Canada Bridge," and in the competition for the work America has proved herself more than equal to Great Britain. This order will give employment to the works until the middle of August.

The Kurtzown Furnace was not blown in as was reported through some papers, but everything is ready, and it is presumed that work will be commenced soon.

At the Crowther Iron Co.'s Furnace steam is raised in the boilers in the usual way by the waste under the boilers. After the accident, noted heretofore, they undertook to raise steam in boilers 66 feet long, by a coal fire at one end. The effect of this experiment was the twisting of the boilers out of position and breaking near the center.

The foundations for the nail machines in the Aetna Iron Co.'s Factory have been torn away and rebuilt within the past two weeks. On the occasion of our visit there Wednesday the timbers upon which the machines were to rest were being put in place. The repairs, and the attachment, Coyne's automatic picker, to every machine, will be done in a short time and the factory started.—*Newcastle Courant*.

Some recent tests of iron manufactured by Lowry, Eichberger & Sons, Barre Forge, develop the fact that in the manufacture of horseshoe nails, stay and carriage bolts it is equal if not superior to "Swedish" iron, an item of news of some interest to the manufacturers of these classes of goods.

PITTSBURGH AND VICINITY.

Spang, Chalfant & Co. have an order for six miles of pipe to convey crude oil from Connipawip to the new refinery at Jersey City.

Wilson, Walker & Co. have orders enough for railroad specialties to run their forge until July.

The Pittsburgh Forge and Iron Company are quite well off for orders.

Reese, Graff & Woods are making a product they term Reese's fibrous steel. A specimen we saw has a beautiful, clean, fibrous appearance. We understand it is made from Bessemer scrap worked in the puddling furnace very much as scrap iron is. The limit of elasticity in the piece we saw was 33,000 lbs., and the tensile strength 57,000 lbs. per square inch of original section.

The polishing and cold rolled iron mill of the American Iron Works—the only one in this country—is constantly going, but in some of the other departments full time is not made by the operatives.

W. D. Wood & Co. resumed work at their mill on Monday, after nearly two weeks idleness caused by the flood on the Monongahela—taking possession of their mill. This is the fourth time in two years.

It is rumored that several sales of high grade pig irons have been made by the furnaces direct the past week.

The Pittsburgh and McKeesport Car Company have just completed and shipped to Texas the "Pandora," a handsome new engine designed for the Longview and Sabine Valley Narrow Gauge Railway. The locomotive was built with all the latest improvements and finished in fine style, and is a credit to the McKeesport builders.

Messrs. Anderson & Passavant have contracted with Mr. J. Lloyd Haigh to furnish the steel from which the wire for the New York and Brooklyn bridge is to be made. Mr. Haigh will require 3400 tons, or 6,800,000 pounds of this steel. A test made last week of a 10 ton shipment of wire shows a tensile strength of 4550 pounds with 04 stretch and an elastic limit of 2800 pounds. The equivalent tensile strength per square inch is about 210,000 pounds. In order to fill this Wharton contract without an interference to other orders, the above firm are negotiating for the lease of the old Wharton mill.

Mr. W. R. Jones, superintendent of the Edgar Thomson Steel Works, at Bessemer Station, has received an invitation from Herr Krupp, proprietor of the Krupp Works, at Essen, Prussia, to visit his works at his (Krupp's) expense, and to become his guest during the visit. This is a deserved compliment to Mr. Jones, and is made in consideration of his courtesy to a son of Herr Krupp who visited the works under Mr. Jones' charge last summer. He was particularly pleased with a saw invented by superintendent Jones for cutting cold steel rails, and obtaining drawings of the same, forwarded them to the works in Prussia. Herr Krupp had a saw constructed in accordance with its success, and was so delighted with its success that he has sent a letter to superintendent Jones complimenting him in the highest terms, and extending the invitation as above stated.

WEST VIRGINIA.

The Belmont Nail Works Co.'s (Wheeling) boilers have gone to work after a holiday of seven weeks.

The following are the newly elected directors of some of the Wheeling iron companies: Bessemer Iron Works—Board of directors: L. S. Delaplane, Alex. Laughlin, Thos. Hughes, E. W. Paxton, G. B. Caldwell, Jas. H. Oglebay, L. F. Stifel, A. W. Campbell, J. G. Hoffman. The only change in the board is the election of Mr. (Continued on page 11.)

J. CLARK WILSON & CO.,

Hardware Manufacturers' Agents

AND

Commission Merchants,

81 BEEKMAN STREET, N. Y.

Agents for

THE DAVIS LEVEL AND TOOL CO.

Manufacturers of Plumb and Levels, Inclinometers, Plumb Level and Inclinometer Combined, Level Glasses, and IRON BENCH and BLOCK PLANES.



Iron Block Plane..... Per Dozen, \$9.00

Special Discount to the Jobbing Trade on Iron Planes.

Price Lists furnished on application.

ANSONIA CORRUGATED STOVE PLATFORM

Manufactured by the

Ansonia Brass & Copper Co.

Office, 19 & 21 Cliff Street,

NEW YORK.

The Ansonia Corrugated Stove Platform, with its heavy figured ogee border, is believed to be the best. Platform offered to the trade. As shown in the illustrated section herewith it requires no nailing to keep it in place or to prevent it from turning up at the edge; while the metal is of sufficient thickness to require no lining.

The low price, superior quality and fine finish of this Platform will be readily acknowledged. Packed 100 in a case.

Send for price list.

Cut Showing Round Platform.

Section Showing Edge.

English Standard Wire Gauges



MADE BY
DARLING, BROWN & SHARPE, Providence, R. I.

USE THE BEST.



Pawtucket, R. I.

The American File Company have the exclusive right to use the Bernot process for cutting files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth. They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works.

Price lists and information furnished on application.

AMERICAN FILE CO., Pawtucket, R. I.

THE BEST IS THE CHEAPEST.

McCaffrey's Standard American Hand Cut Files and Rasps are warranted to do more work than any other files and rasps in the market.

SILVER MEDAL



TRADE MARK



HIGHEST PREMIUM.

ELIAS G. HELLER,
PETER J. HELLER.GEO. E. HELLER,
JOHN J. HELLER.

We invite the attention of the trade to our Celebrated American

Horse Rasps
and Files.

made from the very best American Steel, all cut by hand, and warranted to give entire satisfaction. If requested, we will send sample lots to be returned or held subject to our order, free of charge, not to exceed one month. Goods not stamped as the annexed incorporated trade mark are not genuine. Sold by Hardware dealers generally.

FILES &
RASPS.

Established 1858.

Best Cast Steel.
HAND-CUT. Manufactured by
JOHNSON & BRO.
No. 1 Commercial Street, Newark, N. J.

Established 1835. TRADE MARK ON

New Pattern

JOHN ROTHERY,
T & M
MATTEAWAN

Horse Rasps,

N. Y. John Rothery's

HAND-CUT FILES and RASPS,

Made from English Cast Steel.

JOHN & WILLIAM ROTHERY,

Matteawan, N. Y.



Putnam's Government Standard
FORGED

Hammer Pointed
HORSE SHOE NAILS,

READY FOR DRIVING.

Manufactured from the best of NORWAY Iron

and warranted to give entire satisfaction.

S. S. PUTNAM & CO.,

NEPONSET, MASS.

PENNSYLVANIA FILE WORKS.

McCAFFREY & BRO.,

No. 1732, 1734 & 1736 North Fourth St., Phila.

Messrs. ARNOLD & CO., 310 California St., San Francisco. Sole Agents for the Pacific Coast.

ESTABLISHED 1848.



FILES and RASPS
ENGLISH CAST STEEL.
Made from Best
Quality guaranteed by written warranty
when required.

AUBURN FILE WORKS,

Superior Hand-Cut

FILES AND RASPS,

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.

FULLER BROS., Sole Agents,

89 Chambers and 71 Reade Streets, N. Y.

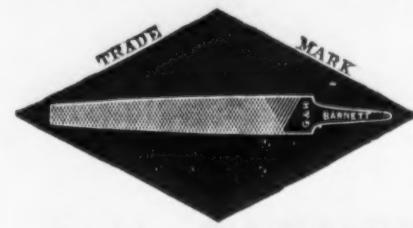
Hiscox File Manufacturing Co.,
WEST CHELMSFORD, MASS.,
MANUFACTURERS OF EVERY DESCRIPTION
OF
FILES and
RASPS.

Alfred Field & Co.,
93 Chambers & 75 Reade Sts.,
NEW YORK CITY,
GENERAL AGENTS.

All Goods Warranted.

Black Diamond File Works.

Send for Illus-
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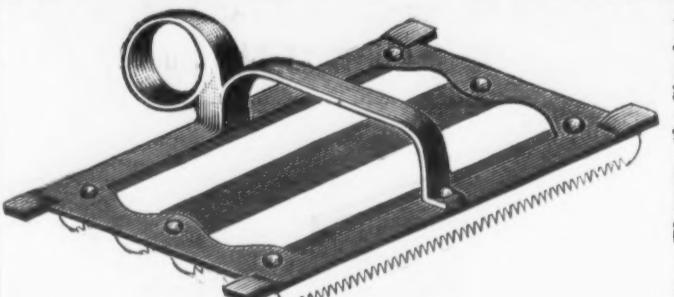
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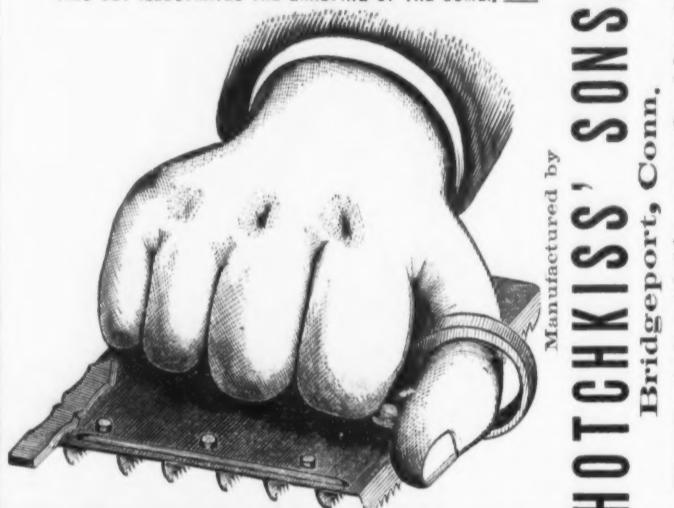
The Sugar Maker's Friend.

Agents wanted in every Sugar District to canvass for the sale of
Post's Patent Metallic Eureka Saps, Circulars and Terminals. Post paid
on receipt of 20 cents. Address, C. C. POST, Manuf. & Patentee, Burlington, Vt.

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NEW HAMPSHIRE.
The Manchester Locomotive Works, Manchester, have lately finished 14 engines, eight for the Quebec, Montreal, Ottawa and Occidental Railroad, four for the Boston and Maine, and two for Western roads.

NEW JERSEY.

In October the work of remodeling the furnace of the Oxford Iron Company was begun, under the superintendence of John R. Hoffmaster, of Reading, and on Saturday, the 20th ult., it was finished to the entire satisfaction of the company.

NEW YORK.
The Jefferson Iron Company's (Sterlingbush) cold-blast furnace is stocked with charcoal and ore for a year's run. The furnace is at the present time running very well.

PENNSYLVANIA.
The Pennsylvania Railroad Company have issued orders for the construction, at their shops in Altoona, of one thousand freight cars. It will require the entire force of the "lower shops" for three months to fill the order.

The Tamaqua Rolling Mill, C. F. Shorner, proprietor, went into operation on Monday, January 22, in the manufacture of cotton bale hoop iron. The mill has been altered from merchant purposes to suit this class of work. One billet train is run full time and a hoop train double time, for the production of nine tons of hoop iron per day.

It is reported that the West Middlesex Rolling Mill is to resume operations about the first of this month.

On Saturday evening, the 20th ult., the Allentown Rolling Mill Co.'s machine shops suspended operations indefinitely. The cause was a lack of orders.

It is reported that the Glendon Iron Company are about to blow in an additional stack.

After a suspension of four weeks, Charming Forge has again started up, with the expectation of running strong for some time to come.

The Keystone Hardware Manufacturing Company, Reading, are running full to fill increased orders for February and March.

About 700 men find employment for eight hours per day in the shops of the Delaware, Lackawanna and Western Railroad Company, at Scranton.

Henry Pott & Bro., Lebanon, recently shipped a 15 horse-power vertical tubular boiler to parties in Philadelphia. They are also constructing a 20 horse-power locomotive boiler, which will be finished this week, for parties in Franklin, Philadelphia. They have received a contract from Philadelphia for 5 vertical boilers.

The locomotive works, at Connellsburg, are now running full time, and have a large number of unfilled orders.

Messrs. Sheeler, Buckwalter & Co., proprietors of the large newly erected stove foundry at Royer's Ford, have ordered one of Mr. Weimer's high speed blowing engines, for blowing their cupola. The engine is to be completed by March 1st, and is warranted to perform its duty. The blowing engine for the Messrs. Mellers was shipped last week. The engine for Messrs. Sheeler, Buckwalter & Co. will be the seventh engine built of this class at the Weimer Machine Works since the first Centennial engine was designed.

The large rolling mill of the P. & R. Coal and Iron Company, in North Reading, after being in operation three weeks, has again stopped until February 5th. The mill was idle seven weeks previous to the three weeks' operation.

The Scranton Republican says: The Dickson Manufacturing Company are busy filling orders for locomotives, and will be able to give work to a considerable number of mechanics until the opening of spring, with fair prospects for the future.

The chain factory attached to the Westerman Iron Works, Sharon, is running as steadily as a spring of water, averaging about 1700 weight of chains per day. There are 19 fires in operation.

Coyne's patent nail picker is to be put in the nail machines at Kimberly, Carres & Co.'s, Sharon.

The National Locomotive Works, at Connellsburg, have a full force on and a number of engines under construction.

The Baldwin Locomotive Works, Philadelphia, recently delivered a new engine to the Union Railway and Transit Company, of St. Louis, for service on the bridge.

The Phoenixville Iron Company have received an order for the erection of the huge structure known as the "Canada Bridge," and in the competition for the work America has proved herself more equal to Great Britain. This order will give employment to the works until the middle of August.

The Kurtzow Furnace was not blown in as was reported through some papers, but everything is ready, and it is presumed that work will be commenced soon.

At the Crowther Iron Co.'s Furnace steam is raised in the boilers in the usual way by the waste under the boilers. After the accident, noted heretofore, they undertook to raise steam in boilers 66 feet long, by a coal fire at one end. The effect of this experiment was the twisting of the boilers out of position and breaking near the center.

The foundations for the nail machines in the Aetna Iron Co.'s Factory have been torn away and rebuilt within the past two weeks. On the occasion of our visit there Wednesday the timbers upon which the machines were to rest were being put in place. The repairs, and the attachment, Coyne's automatic picker, to every machine, will be done in a short time and the factory started.—Newcastle Courier.

Some recent tests of iron manufactured by Lowry, Eichelberger & Sons, Barre Forge, develop the fact that in the manufacture of horseshoe nails, stay and carriage bolts it is equal if not superior to "Swedish" iron, an item of news of some interest to the manufacturers of these classes of goods.

PITTSBURGH AND VICINITY.

Span, Chalfant & Co. have an order for six miles of pipe to convey crude oil from Conimicut to the new refinery at Jersey City.

Wilson, Walker & Co. have orders enough for railroad specialties to run their forge until July.

The Pittsburgh Forge and Iron Company are quite well off for orders.

Reese, Graff & Woods are making a product they term Reese's fibrous steel. A specimen we saw has a beautiful, clean, fibrous appearance. We understand it is made from Bessemer scrap worked in the puddling furnace very much as scrap iron is. The limit of elasticity in the piece we saw was 33,000 lbs., and the tensile strength 57,000 lbs. per square inch of original section.

The polishing and cold rolled iron mill of the American Iron Works—the only one in this country—is constantly going, but in some of the other departments full time is not made by the operatives.

W. D. Wood & Co. resumed work at their mill on Monday, after nearly two weeks idleness caused by the flood on the Monongahela taking possession of their mill. This is the fourth time in two years.

It is rumored that several sales of high grade pig irons have been made by the furnaces direct the past week.

The Pittsburgh and McKeesport Car Company have just completed and shipped to Texas the "Pandora," a handsome new engine designed for the Longview and Sabine Valley Narrow Gauge Railway. The locomotive was built with all the latest improvements and finished in fine style, and is a credit to the McKeesport builders.

Messrs. Anderson & Passavant have contracted with Mr. J. Lloyd Haigh to furnish the steel from which the wire for the New York and Brooklyn bridge is to be made. Mr. Haigh will require 3400 tons, or 6,800,000 pounds of this steel.

A test made last week of a 10 ton shipment of wire shows a tensile strength of 4550 pounds with 04 stretch and an elastic limit of 2800 pounds. The equivalent tensile strength per square inch is about 210,000 pounds. In order to fill this Wharton contract without an interference to other orders, the above firm are negotiating for the lease of the old Wharton mill.

Mr. W. R. Jones, superintendent of the Edgar Thomson Steel Works, at Bessemer Station, has received an invitation from Herr Krupp, proprietor of the Krupp Works, at Essen, Prussia, to visit his works at his (Krupp's) expense, and to become his guest during the visit. This is a deserved compliment to Mr. Jones, and is made in consideration of his courtesy to a son of Herr Krupp who visited the works under Mr. Jones' charge last summer. He was particularly pleased with a saw invented by superintendent Jones for cutting cold steel rails, and obtaining drawings of the same, forwarded them to the works in Prussia. Herr Krupp had a saw constructed in accordance with the drawings, and was so delighted with its success that he has sent a letter to superintendent Jones complimenting him in the highest terms, and extending the invitation as above stated.

WEST VIRGINIA.

The Belmont Nail Works Co.'s (Wheeling) boilers have gone to work after a holiday of seven weeks.

The following are the newly elected directors of some of the Wheeling iron companies: Bessemer Iron Works—Board of directors: L. S. Delaplaine, Alex. Laughlin, Thos. Hughes, E. W. Paxton, G. B. Caldwell, Jas. H. Oglebay, L. F. Stifel, A. W. Campbell, J. G. Hoffman. The only change in the board is the election of Mr. (Continued on page 11.)

J. CLARK WILSON & CO.,

Hardware Manufacturers' Agents

AND

Commission Merchants,

81 BEEKMAN STREET, N. Y.

Agents for

THE DAVIS LEVEL AND TOOL CO.

Manufacturers of Plumbs and Levels, Inclinometers, Plumb Level and Inclinometer Combined, Level Glasses, and IRON BENCH and BLOCK PLANES.



IRON BLOCK PLANE. Per Dozen, \$9.00

Special Discount to the Jobbing Trade on Iron Planes.

Price Lists furnished on application.

ANSONIA CORRUGATED STOVE PLATFORM

Manufactured by the

Ansonia Brass & Copper Co.

Office, 19 & 21 Cliff Street,

NEW YORK.

The Ansonia Corrugated Stove Platform, with its heavy iron base, is believed to be the best. Platform offered to the trade. As shown in the illustrated section herewith it requires no nailing to keep it in place or to prevent it from turning up at the edge; while the metal is of sufficient thickness to require no lining.

The low price, superior quality, and fine finish of this Platform will be readily acknowledged. Packed 100 in a case. Send for price list.

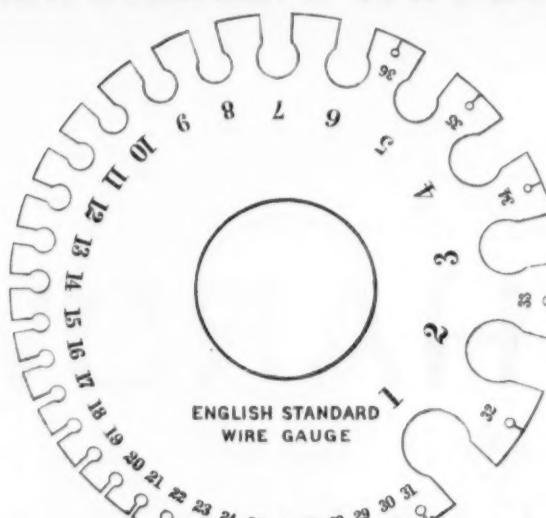


Section Showing Edge.

Cut Showing Round Platform.

ENGLISH STANDARD WIRE GAUGES

ENGLISH STANDARD WIRE GAUGE



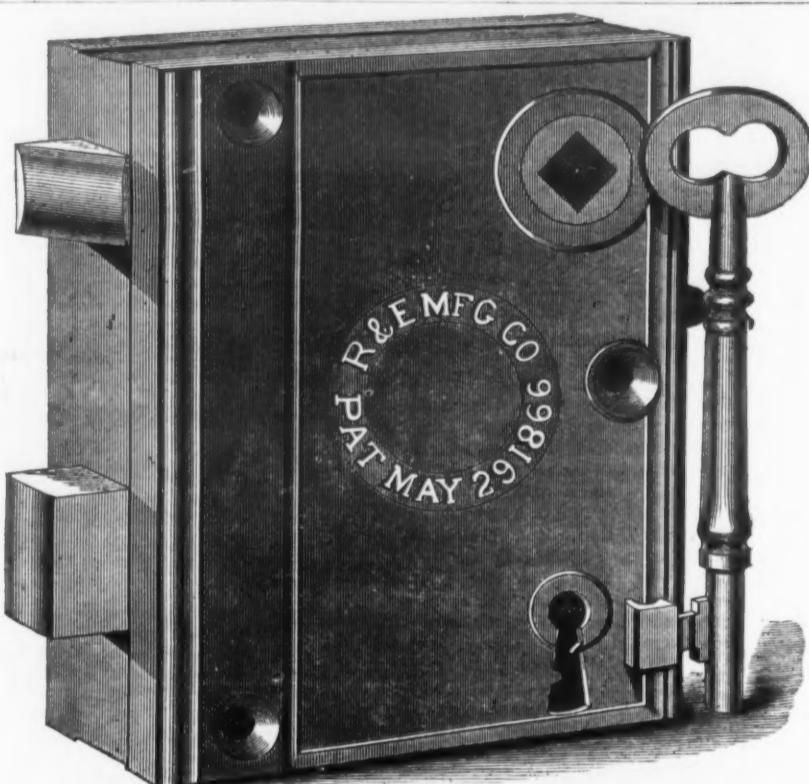
RUSSELL & ERWIN MANUFACTURING COMPANY

Manufacturers of **HARDWARE**.

FACTORIES, - - - - NEW BRITAIN, CONNECTICUT, U. S. A.

MANUFACTURERS' AGENTS AND DEALERS IN GENERAL HARDWARE AT OUR

WAREHOUSES: NEW YORK, 45 & 47 Chambers St.; PHILADELPHIA, 425 Market St.; SOUTHERN DEPARTMENT, BALTIMORE, MD., WM. H. COLE, Agent, 17 S. Charles St.



NEW GOODS.

In consequence of the high prices established for Brass Bolt Rim Locks and Latches, we have determined to place upon the market a new line of **BRASS-PLATED** goods, for which we solicit orders for immediate delivery. We shall increase our variety as occasion may require.

These goods are furnished with **BRASS-PLATED BOLTS** and **SOLID BRASS KEYS**, and in make and finish are equal to our standard goods.

Discounts, same as on our regular goods.

HOME UPRIGHT RIM KNOB LOCKS. PULL-OUT REVERSE.

No.	Size.		Without Knobs Per Dozen.
B 861	4 inch.	Janus face, 2 Brass-plated Bolts, Solid Brass Key, without Stop.	\$5.00
B 861½	4 inch.	" " " " with Stop.	5.25

HORIZONTAL RURAL KNOB LATCHES.

No.	Size.		Without Knobs Per Dozen.
B 557	3½ inch.	Brass-plated Latch Bolt	\$4.00
B 552	3½ inch.	" " and Slide Bolt	5.00

SCREWS.

We are now producing over 6000 gross per day of **Flat Head Gimlet Point Screws** of **Quality** and **Finish** which we **Guarantee** to be **Superior** to that of any other Screws manufactured in the **World**, and we invite a comparison under the **Severest Tests**.

Our prices will at all times be as low as those of any standard manufacturers, and we solicit letters of inquiry for quotations before orders are given elsewhere.

Our Screws are all packed in our new Patent Paper Boxes bearing our labels, on which are **Large Figures** denoting the **Size** and **Number**.

CABINET LOCKS.



Our assortment of these goods is complete, and we can also supply a full line of "Eagle" and "Gaylord" Locks at manufacturers' prices.

An **ILLUSTRATED CATALOGUE** will be issued at an early date. Parties can meanwhile order by either Eagle or Gaylord numbers.

PADLOCKS.

A FULL ASSORTMENT

WITH

Iron & Nickel-Plated Steel Keys.

Will illustrate new styles in Volume

4, which will be issued soon.

FINE BUILDERS' HARDWARE

in Real Bronze, Nickel,

Nickel & Gold, Antique,

Illuminated & Gilt.

ALSO

Door Locks & Latches.

RIM and MORTISE, of all descriptions.

We have also a full line of

GENERAL HARDWARE,

which we offer as Manufacturers' Agents, or at Manufacturers' prices. We have in press, and shall soon issue our usual **SPRING DISCOUNT SHEET** with latest quotations, and also **NEW PAGES** to Volume 3 with illustrations of **NEW AND DESIRABLE GOODS**.

Cutlery.

FRIEDMANN & LAUTERJUNG,

Manufacturers of PEN AND POCKET CUTLERY.
Solid Steel Scissors, Shears, Razors,
Russia Leather Straps, Hones, &c.



Sole proprietors of the renowned full concave patent.

"ELECTRIC RAZORS,"
celebrated "ELECTRIC SHEARS." Nickel Plated Bows.

Agents for the BENGALL RAZORS.

AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &c.
91 Chambers and 73 Reade Sts., N. Y. 423 N. Fifth St., ST. LOUIS, MO.

MERIDEN CUTLERY CO.

Received the HIGHEST CENTENNIAL PRIZE.



MANUFACTURE ALL KINDS OF TABLE CUTLERY.

Exclusive Makers of the "PATENT IVORY" or Celluloid Knives, the most durable WHITE HANDLE known. The Oldest Manufacturers in America. Original Makers of the HARD RUBBER HANDLE. Always call for "Trade Mark" "MERIDEN CUTLERY CO." on the blade. Warranted and sold by all Dealers in Cutlery, and by the MERIDEN CUTLERY CO., 49 Chambers Street, New York.



THE MILLER BROTHERS CUTLERY CO.,

Manufacturers of
PATENT FINE PEN & POCKET CUTLERY
WENT MERIDEN, CONN.

The only Knives made that are put together in such a manner that there is no strain on the covering or frail part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the Best American Knife. We also make
NICKEL & SILVER PLATED POCKET KNIVES

which will not rust or become discolored when used as a Fruit Knife, and their cutting qualities are equal to any other knife. Orders filled from the factory, and in New York by Messrs. J. Clark & Wilson Co., No. 81 Beekman Street (who have a full stock of all patterns always on hand), and also by Messrs. G. B. Walbridge & Co., No. 99 Chambers Street.

NAUGATUCK CUTLERY CO.,
Manufacturers of FINE PEN & POCKET CUTLERY.

FULLER BROS., Sole Agents, 89 Chambers and 71 Reade Sts., N. Y.

HALL, ELTON & CO.,

Electro Plated Ware, German Silver and Britannia Spoons.



THE "PALACE."

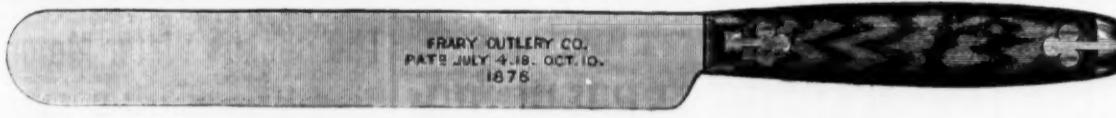
Factories, Wallingford, Conn.

Salesroom, 75 Chambers Street, New York.

THE FRARY CUTLERY COMPANY,

FACTORY, Bridgeport, Conn. NEW YORK OFFICE & WAREHOUSE, No. 89 Chambers St.

Manufacturers of all kinds of Table Cutlery.

FRARY CUTLERY CO.
PAT 8 JULY 4. 18. OCT. 10.
1876

The above Illustrations represent their New Patent Screw Tang Lock Solid Handle Knife.

There is no question but that a solid handle knife is much more preferable than a scale tang. The great objection to their use hitherto is, that no solid wood handle has been placed on the market with the handle properly secured—no handle put on with cement will stand the wear and tear of every day usage. The cement will expand and contract with the action of heat and cold, and become loose, crack and come off, causing great prejudice against their use. This objection is overcome in our patent screw tang. A wood screw is wedged to the tang of the knife or fork, and screwed firmly and securely in the handle and locked there by the bolster, making a very strong and handsome knife, which we warrant never to get loose, crack or come off. We manufacture a large variety of patterns, both Table, Butchers and Carvers, and furnish the patent handle nearly as low as the scale tang, and we are prepared to furnish this line of goods, together with the scale tang and iron handle, very promptly, and we very respectfully invite the attention of the trade.

OWEN & CAMPBELL, THE ROGERS CUTLERY CO.,

Manufacturers of

PEN AND POCKET
CUTLERY.

All blades forged from the best English Cast Steel, and Warranted. Each knife is made in the most substantial and compact manner, all articles used being of the best quality. All blades stamped Owen & Campbell, Philadelphia.

Orders filled from the Factory Rear of

220 N. Second St., PHILADELPHIA.



MANUFACTURERS OF

Cutlery & Silver Plated Goods.

HARTFORD, CONN.

P. O. Box 204.

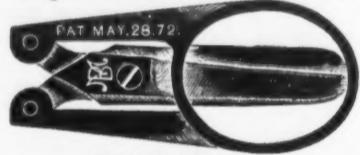
Cutlery.

ESTABLISHED 1852.
NEW YORK KNIFE CO.

MANUFACTURERS OF SUPERIOR

Table & Pocket Cutlery,
WARRANTED TO BE MADE OF THE BEST
MATERIAL.WALKILL RIVER WORKS,
Walden, Orange Co., New York.
THOS. J. BRADLEY, President.

Young's Patent Folding Scissors.



PAT MAY 28. 72.

These Scissors are made of the very best steel, nickel plated, and so constructed that they can be readily folded and carried in the pocket without injury to the garments. A sample pair will be sent by mail, to the trade only, on receipt of the sum of the price, namely, \$1.00. For small size, either blunt or pointed. \$1.00. Large size, pointed or half pointed. \$1.50. New York, Feb. 1st, 1876.

MARX BROS., Proprietors,
430 Broadway.AMERICAN
PEN AND POCKET KNIVES,MANUFACTURED BY PEPPERELL,
Aaron Burkinshaw, AB MASSACHUSETTS

My Blades are forged from the best Cast Steel, and warranted. To me was awarded the GOLD MEDAL of the Connecticut State Agricultural Society; also a silver and Diploma from the Mass. Mechanics' Ass'n Sept. 1869.

Established 1853.
AMERICAN SHEAR CO.Manufacturers of
Pen and Pocket Cutlery,

Shears, Scissors and Pruning Shears,

HOTCHKISSVILLE, CONN.

Salesroom, 295 Broadway, New York, with
LANDERS, FRARY & CLARK.

Cutlery.

JOSEPH S. FISHER,
No. 411 Commerce St., PHILADELPHIA

AGENT FOR

George Wostenholm & Son,

"Limited."

Washington Works, SHEFFIELD,

Celebrated I-XL Cutlery, Razors, &c

AGENT FOR

WALTER SPENCER & CO.,

Steel and File Manufacturers,

Rotherham, ENGLAND.

Corporate Mark.



Granted 1777.

F. W. HARROLD,
Birmingham and Sheffield,
ENGLAND.Importer on Commission
of
HARDWARE, CUTLERY, GUNS, &c.W. SANDERS, Agent,
76 Reade Street, N. Y.

CORPORATE MARK,

Joseph Rodgers & Sons'
(LIMITED)

CELEBRATED CUTLERY,

No. 82 Chambers Street, New York.

F. & W. CLATWORTHY, Agents.

The demand for Joseph Rodgers & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam power.

To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear their Corporate Mark.

VAN WART, SON & CO.

Hardware Commission Merchants,

EXPORTERS AND IMPORTERS,

BIRMINGHAM, - ENGLAND

Agents,

McCoy & Company,

134 & 136 Duane Street, N. Y.

George H. Gray & Danforth,

48 India Street, Boston.

F. W. TILTON.

17 Old Levee Street, New Orleans.

At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for

John Rimmer & Sons' Celebrated Harness and other Needles.

W. Clark's Genuine Horse Clippers.

Seydel's "Ashantee" Pocket Hammock

McCoy & Company,

BORAX A SPECIALTY,

134 & 136 Duane St., New York.

ICE HOUSE HINGES AND
FASTENINGS

Manufactured and for sale by

A. A. IRVINE,

No. 14 Murray St., New York.

P. O. Box 3034.

H. G. DeBAUN,

179 William St., N. Y., Dealer in

Glue, Emery, Crocus,

SAND AND EMERY PAPERS,

And all kinds of Polishing Goods.

HUGH W. ADAMS,

Iron Commission Merchant.

RAILWAY, PIG AND SCRAP IRON.

56 Pine Street, N. Y.

Agent, Millerstown Iron Co.'s Foundry Pig Iron.

Grove Bros. Columbia Furnaces, Foundry and Forge

Big Irons. Eureka Iron Co.'s (Detroit, Mich.) Lake

Superior Charcoal Pig Iron.

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets; Common and Swedish Iron, Leathered, Carpet, Lace and Glass Tacks; Finishing, Hungarian, Trunk, Cloot and Glass Box Nails, &c. Rivets made to Order.

NEW YORK AGENCY

Grundy & Kenworthy

HARDWARE.

165 Greenwich Street,

Agent for the Philadelphia Star Carriage and Tire Bolts

Established in 1836.

Shelton Company,

Manufacturers of every variety of

TACKS & SMALL NAILS.

Carriage, Machine, Plow, Stove and

Tire Bolts, Coach Screws,

Bed Screws, &c.

BIRMINGHAM, CONN.

(Continued from page 9.)

INDUSTRIAL ITEMS.

WEST VIRGINIA.

Jas. Oglebay, vice C. Oglebay, deceased. Wheeling Hinge Co.—Board of directors: A. W. Campbell, A. G. Robinson, C. D. Hubbard, O. J. Crawford, J. L. Hobbs, John McLure, L. E. Hanson, C. J. Rawling, I. H. Williams; officers: A. G. Robinson, president; L. E. Hanson, vice-president; I. H. Williams, secretary. The only change in the board is the election of Mr. C. J. Rawling, vice Mr. G. B. Caldwell, resigned. La Belle Iron Works—Board of directors same as last year, as follows: S. H. Woodward, Henry Wallace, Wm. Linch and John Wright, of Wheeling; and C. B. Doty, David Spaulding and John McClinton, of Steubenville.

OHIO.

Brown, Bonnell & Co., of Youngstown, made last year some 30,000 tons of pig iron; more than ever before.

At the foundry of W. S. Craine & Co., Cleveland, 22 men at present find work, but as business is steadily increasing, it is anticipated that the number of men employed will soon equal 45, the regular force of the shop. Mr. Craine states that the past month has been the only slack period the company have experienced within three years.

Mr. A. B. Stone has been elected president of the Cleveland Rolling Mill Company for the coming year. H. Chisholm will act as vice-president and general manager, while E. S. Page will perform the duties of secretary.

Fifty workmen are employed at the Cleveland Foundry in the manufacture of car wheels. The foundry is being operated to its fullest extent, and the prospects for the future are excellent.

The Ohio Steel Barb Fence Works will probably be run with a full complement of men (150) after the 1st of February. There are now 50 men employed by the company.

The Bellaire Nail Works, Bellaire, have placed their funded debt at a lower rate of interest.

The Athens Messenger says that the new Thomas Iron Works, at Gore, on the Hocking Valley, is making 20 tons of No. 1 iron per day.

John Sharratt and James Sheldon, bricklayers, are building a patent puddling furnace of their own invention at Brown, Bonnell & Co.'s Works. They expect to have the furnace in operation to day.

The Lawrence Mill, at Ironton, is putting in six new boilers, which weigh about 25 tons, and cost \$3400. They were built by Messrs. J. H. Fisher & Co., of the same place, out of Gaylord boiler plate.

Belfort Furnace, Ironton, blew out Tuesday, the 16th ult. Before going in blast again a new hearth will be put in. The company have a large stock of pig iron on hand, and it may be some months before the furnace starts up. The Anna Furnace, Ironton, is making from 60 to 65 tons of good iron every day.

PEACE & HOGAN, VULCAN SAW WORKS.
Manufacturers of every kind of
Patent Ground Saws.
TRADE MARK.
HARVEY W. PEACE & CO.
Circulars, Cross-Cuts, Mill, Mulay, Gang, Hand, and Butcher.
Molding and Planing Knives, Plastering Trowels, Mitering Rods, &c.
Union Avenue, Tenth and Alinside Streets, BROOKLYN, E. D., N. Y.
OFFICE & WAREHOUSE, 59 Beckman St., New York.

E. C. ATKINS, ESTABLISHED 1857. H. KNIPPENBERG.
E. C. ATKINS & CO., Indianapolis, Ind.,
Saw Manufacturers and Repairers.
Soe manufacturers of the celebrated
GENUINE SILVER STEEL DIAMOND X CUT SAW.

\$1.50 Per Foot.



BEWARE OF THE IMITATION CALLED "DIAMOND TOOTH."

Wheeler, Madden & Clemson
MFG. CO.,
MIDDLETOWN, NEW YORK.
Manufacturers of
WARRANTED CAST STEEL
SAWS

Of every description, including
Circular, Shingle, Cross-Cut, Mill, Hand,
WOOD SAWS. Etc., Etc.

AMERICAN SAW CO.,
Manufacturers of
Movable Toothing Circular Saws,
PERFORATED CROSS-CUT SAWS
And SOLID SAWS of all kinds. Trenton N. J.

E. M. BOYNTON,
Manufacturer of all kinds of
First-Class Saws, Saw Frames, Cross-Cut Handles, Tools, Files, &c.
Also Sole Proprietor and Mfr. of the Genuine Patent Lightning Saw,
No. 50 Beckman Street, NEW YORK.

Special attention is called to my new Centennial Saw, patented March 28th, 1876; Special File and Saw-Set combination, patented Jan. 22d, 1876; Patent (Cross-Cut) Saw Handle, patented Feb. 15th, 1876; New Champion Man Saw, with Patent Double Removable Handle Attachment, March 28th, 1876; New Patent Champion Cleaver Tooth, patented August 15th, 1876; Saw Set, patented Nov. 25th, 1875—a perfect set that a blind man can use to confine like a Hammer Set perfectly; Cross-bar Wood Saw Frame, patented Nov. 12, 1873; also Cross-Cut Handle, with castings, patented Feb. 15, 1870. These goods complete the scientific tools for cutting timber, instead of wearing it off with notched V teeth (which are like a fractured plate sharpened).



REPORT ON AWARDS. GROUP NO. 15.
PHILADELPHIA, November 11th, 1876.

Product: Saws in great variety; a special improvement in shape of teeth, called Patent Lightning Saw. Name and address of Exhibitor: E. M. Boynton, New York. The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz.: Given by authority of the U. S. Centennial Commission. A. T. GOSHORN, Director General. J. R. HAWLEY, Pres.

FORT PLAIN SPRING AND AXLE WORKS.



FOR SPRING TRADE.

All dealers in SPRINGS AND AXLES will find it to their interest to send to us for Price List and Discounts.

WOOD, SMITH & CO., Fort Plain, N. Y.

C. R. MOON & CO.,
Dealers of
WROUGHT IRON HARDWARE SPECIALTIES FOR WAGONS,
And all kinds of CARRIAGE AND WAGON MALLEABLES.
Also Manufacturers of
MOON'S IMPROVED NECK YOKE.
The Best and Cheapest in the market. Send for Catalogue.

C. R. MOON & CO., 103 Scranton Ave CLEVELAND, OHIO.

W. C. BARKER & CO.,
Iron, Steel, Nails,
HEAVY HARDWARE, WAGON AND CARRIAGE MATERIAL, DRILLS,
ANVILS, BELLows, VISES, CHAINS, &c.
CHICAGO ILLS.

STANLEY RULE AND LEVEL CO.,
Manufacturers of IMPROVED CARPENTERS' TOOLS.

Factories,
New Britain,
CONN.
Warerooms,
35 Chambers
St., N. Y.



No. 125, Fore Plane, 20 inches in length, 3/4 inch Cutter, \$2.25.

Philadelphia "STAR" Bolt Works.
NORWAY IRON FANCY HEAD BOLTS.
Carriage & Tire Bolts. Star Axle Clips, &c.
TOWNSEND, WILSON & HUBBARD, 2301 Cherry St., Philadelphia, Pa.

COLEMAN
EAGLE BOLT WORKS.
(ESTABLISHED 1845.)

The Original and Only Establishment Manufacturing the
Genuine Coleman Eagle Bolt.

Made of Best Quality

SQUARE NORWAY IRON.

WELSH & LEA,
Successors to M. J. COLEMAN.

WORKS, Columbia Avenue, Hancock and Mascher Sts.,
OFFICE, 145 Columbia Avenue (Late 2030 Arch St.),
PHILADELPHIA.

CARRIAGE BOLTS.

Buy the Best.



Clark's Patent
Carriage Bolt.

Best Bolt manufactured for all kinds of agricultural machinery. Will not split the wood, and cannot turn in its place.

MANUFACTURED BY

CLARK BROS. & CO., Milldale, Conn.

Also Manufacturers of
Plow and Machine Bolts, Coach Screws, Nuts, Washers, Tire Blanks, Rivets, etc.
Send for Illustrated Price List.

HOOPES & TOWNSEND,
PHILADELPHIA.



"Keystone" Boiler Rivets,
BRIDGE & SHIP RIVETS.

ESTABLISHED 1855.

Philadelphia Rivet Works,
CHARLES B. ALLEN,
PHILADELPHIA.

Seventeenth and Hamilton Streets,

The undersigned begs leave to inform his former customers, consumers of and dealers in rivets generally, that he has resumed the manufacture of

BOILER, BRIDGE and SHIP RIVETS,
at the above location, where he will keep constantly on hand a large assortment of all the regular sizes.

Special sizes made to order.

Particular attention paid to the selection of the best quality of iron. A share of your patronage will be thankfully received.

Yours, respectively,
CHAS. B. ALLEN.

WORCESTER MACHINE SCREW CO.,
WORCESTER, MASS. ESTABLISHED 1867.

MANUFACTURERS OF

Standard Machine Screws.

ALSO

Square, Round, and Hexagon Head Set & Cap
Screws, in Iron, Steel and Brass.

We have adopted the American Screw Co.'s price list for Machine Screws. Attention is called to our reduced price list for Set and Cap Screws, adopted January 1, 1877. A full line of all goods kept in stock at both the factory and store of our agents.

H. S. MANNING & CO., No. 111 Liberty St., N. Y.

Send for Lists and Discounts.



TURNED
MACHINE SCREWS.

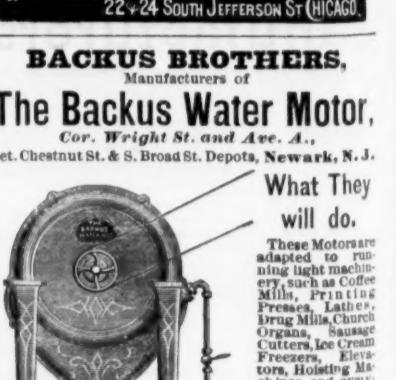
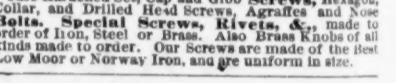
One-sixteenth to five-eighths diameter.
Heads and points to sample.

IRON, STEEL and BRASS.

Lyon & Fellows Mfg. Co.,

Cor. 1st and North 3d Streets, Williamsburgh, N. Y.

TUCKER & DORSEY,
MANUFACTURERS.



H. D. SMITH & CO.,

Plantsville, Conn.,

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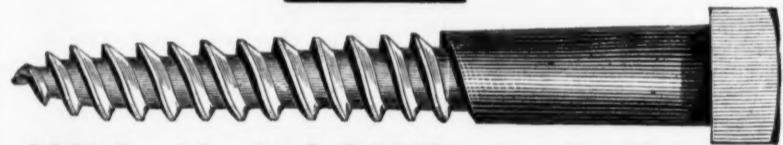
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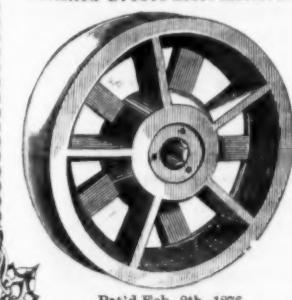
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CONTENTS.

First Page.—Pony-packer's Portable Hoist.
"Old Colony" Iron Cutters. The Brooklyn Bridge.
Iron Railroad Cars. Martyrdom. Hardware and
Iron at San Francisco.

Third Page.—Dr. Nott's Heating Stove. The
Anti-Clinker Grate Suits. The Reading Coal and
Iron Company.

Fifth Page.—New Patents. New Safety Lamp.

Seventh Page.—Drilling Machines.

Ninth Page.—Industrial Items.

Eleventh Page.—Industrial Items.—(Concluded).

Fourteenth Page.—The Commercial Outlook.
The Present Condition of the Western Iron Trade.
The Commercial Value of a Good Name.

Fifteenth Page.—American Beam Engines.
Testing Iron and Steel. Steel Rails. New Public
Actions. Better and Cheaper Steel.

Eighteenth Page.—The National Association
of Stove Manufacturers.

Twenty-first Page.—Trade Report. General
Hardware.

Twenty-second Page.—British Iron Market.
Iron, Metals, Exports, Imports, Coal, Old
Metals, Paper Stock, &c. Philadelphia.

Twenty-third Page.—Pittsburgh, Boston,
St. Louis, Cincinnati, Louisville, Richmond,
Baltimore, Chattanooga, Foreign. English Letter.

Twenty-fourth Page.—English Letter.—(Concluded).
Manufacturing Advantages of Birmingham,
Conn. The Pioneer Furnaces. The Oldest
Angar Manufactory in the United States. Hollow
Concrete Blocks for Building. The Coal Market.

Twenty-eighth Page.—Failures in 1876. Im-
provement in Rolling Mills.

Thirty-first Page.—The Iron Age Direct-
ory.

Thirty-fourth Page.—New York Wholesale
Prices of Hardware and Metals.

Thirty-fifth Page.—New York Wholesale
Prices.—(Concluded).

Thirty-ninth Page.—Philadelphia, Buffalo,
Detroit and Pittsburgh hardware and Metal Prices.

Forty-first Page.—Cincinnati, Boston, St.
Louis hardware and Metal Prices.

The Commercial Outlook.

There are many indications which warrant the belief that we shall witness, during the next three months, a healthy revival in the productive and distributive industries of the country. As we have before said, we believe that the revival last fall was a natural and legitimate result of the working of causes not only favorable to recovering, but necessarily compelling a larger production and a more active commercial movement. There is a limit to the economy of consumption which the people of a country can practice for a term of years. Whatever goes into consumption is sooner or later consumed. If it cannot be eaten by man it is by moth or rust. We can

wear our clothes a long time, perhaps, but they will wear out in time, and we must buy new. The real or imagined necessity for economy which prompted the people of the country to contract their expenditures so sharply when the true nature and serious character of the panic of 1873 was realized, was not without good results in putting a check upon the extravagance which characterized our style of living as a people; but the economy thus induced has been carried somewhat too far. The working classes, only partially employed, are still restricted in their purchasing capacity, but the reason they stand idle is because those who have the means of satisfying their wants are still practising a close and systematic economy. Last fall they were beginning to recover confidence in the stability of things, and to look for a favorable change. It was believed that the bottom had been reached, and the advance of prices and wages incident to a larger demand for labor and commodities gave warrant in this belief. But the conditions were unfavorable. The interruption of the political canvass would probably have been but temporary, and the people were prepared, as heretofore, to accept the result loyally, if not with entire satisfaction. When it was known that the result was so delicately balanced that a decision could not be reached for months, the popular excitement and apprehension reacted upon trade, and the country was once more plunged into the depths of depression. At a time when our political system was subjected to a new and unexpected danger which menaced it even more seriously than any of the tests to which it was subjected, the growing confidence of the people was once more shaken, and even the most enterprising stood with folded hands waiting to see what would come. Fortunately for the country, statesmanship has triumphed over partisanship, and the passage of the bill looking to an amicable and correct count of the electoral vote is hailed by the whole country with satisfaction. The issue of the election, so far as the choice of President is concerned, is of little practical importance, provided that issue is decided in accordance with justice and right. A majority of our people believe that the affairs of the nation would be safe in the hands of either of the aspirants to the presidential chair. Both are men of broad and liberal views, and both are committed to a policy looking to economy, to civil service reform and to a return to a specie basis by the easiest and safest of practicable methods. Before the time for active business shall have fairly come, all doubts as to the correctness of the count will have been settled, and nothing in the political situation will remain to menace the peace and welfare of the country during the next four years. If, then, as we believe, the conditions are all favorable to a continuance of the improvement so fairly begun in September and October last year, 1877 should realize all reasonable expectations. That stocks of merchandise in retailers' hands are very light, and that a very general replenishment is necessary before they will be prepared to meet even an average consumptive demand, is generally admitted. Real estate is no longer held at fictitious valuations, and leases made this spring will probably be based upon the lowest rentals demanded for many years. The greenback is within 6 per cent. (a year's interest) of gold, wages are as low as they are likely to go, and prices have adjusted themselves to a gold basis. Through all the long period of uncertainty and excitement gold has steadily worked down and government bonds have manifested unusual firmness. The sensitive barometer of the financial markets has failed to record any indication of trouble in the threatening wind clouds of the political horizon, and when the excitement is all over and the result of the election declared, we shall probably make the discovery that the country has been safe all through, and that the solid good sense and unshaken loyalty of the American people counts for more than the froth of political debate or the wrath of a partisan newspaper press.

We do not claim the gift of prophetic power, and experience has taught us that, in times like these, it is well to be cautious in forecasting the future. We fail to see, however, anything in the situation or the outlook which is not favorable to revival, and unless new and now unforeseen events shall complicate the situation and again paralyze our national energies, we may hope that before another three months the whirl of busy mill wheels and the clang of heavy hammers will once more gladden the hearts of the people, and that a new life will thrill through the sluggish pulses of trade. We must not forget, however, that our progress toward solid ground must be on a bridge of thin ice for some time to come. Trade will remain peculiarly sensitive to unfavorable influences,

and nothing will so quickly and effectually check consumption as an attempt to advance prices in anticipation of a legitimate basis for such an advance. Those who think revival means a return of the conditions existing before the panic will find themselves much disappointed. Close economy in production and distribution, a more conservative business policy, and a careful application to the daily affairs of life of the knowledge to be gained from the experiences of the past four years, will be found the indispensable conditions of success in business. We have had our wild dance and the piper has been paid. Now we are ready to walk soberly and with good heed to our footsteps.

The Present Condition of the Western Iron Trade.

It is undeniable that there is a strong feeling among iron manufacturers that the worst has been felt, and that the close of 1877 will see a marked improvement in the iron trade. While some of the more enthusiastic manufacturers, both of pig and merchant iron, look for an immediate and decided change for the better, both in prices and demand, the more cautious and conservative will be satisfied, all things considered, if it comes later in the year, though many of them look for a decided improvement in the tone of the market at once.

There are a number of reasons that justify this anticipation. In discussing them we do so in reference to the Western market alone, as it is generally conceded that any improvement must begin here. There can be but little improvement in pig until there is a better state of things in the merchant iron trade, and in this trade the West has been the most demoralized. Prices have ruled lower, its iron has been put into the Eastern market at rates which some of the Eastern makers would not touch, and the West is in better shape to inaugurate a movement that will commit the manufacturers of merchant iron to a united policy as to prices and production. For these reasons we confine our remarks to the West.

In regard to pig iron we say, first, that the West is almost bare of coke mill irons. We have gone over this subject very carefully, and have compared our figures with those of some of the best Western furnace men, and we unhesitatingly say, first, that there are 200,000 tons of iron less in the West to-day than one year ago, and second, that the stocks are still being reduced. We shall have more to say of this in a future number.

A second point regarding pig iron is that there is beginning to be a better demand for high grade pig, or pig made without cinder, or at least with not over ten per cent. For example, the Allen Furnace, which has been out for years, and which had some very good iron on hand at the close of its blast, which has been held for high figures, has sold more since January 1st than during the whole year 1876. Negotiations are pending for the sale of some fair blocks of Spearman and Rosen iron at prices which buyers laughed at three months ago, saying cinder iron answered their purpose. They are finding their mistake.

And this leads us to merchant iron. There are indications here that are most healthy. In the first place merchants and consumers are beginning to learn that if they buy \$1.80 iron they get \$1.80 iron and not \$2 iron. They have been fooling themselves into believing that they could pay \$1.80 for bars and get \$2.25 iron, and after having made a contract at a low figure, they have poked themselves under the ribs, and laughed at their own wisdom and the good bargains they have made. But merchants and consumers have no vested right in all the wisdom in the iron trade, nor have the manufacturers been endowed with all the foolishness, though it must be confessed they seem to have had their full share. Still, the manufacturers had some wisdom, and when they sold \$1.80 iron they made and furnished \$1.80 iron, and the customer had no just grounds for complaint, for it was what he bought and paid for. They are learning this, and as, for some purposes, they must have better iron than \$1.80, they are asking for it and paying for it, and it is the demand for this grade of iron that has made the better demand for high grade pig iron which we have mentioned above.

Another healthy indication for the future is the way in which stocks are held. The stocks of merchant iron in the West are to-day largely held by the manufacturers and not by the jobbers and merchants. This is especially noticeable in regard to nails. The stocks held by middlemen are not one-quarter what they were a year ago. One nail manufacturer stated in our hearing a few days since, that a year ago he had 30,000 kegs of nails in the hands of agents, while now he has not 5000 kegs.

Any manufacturer who has watched the course of his orders will be convinced from these alone that stocks are light. Orders are small, for small quantities of a size, and frequent. The spring trade will open with very light stocks. When merchants are convinced that the movement is upward there will be a rush for iron that will more than consume all the stocks the mills have. And some consumers of iron are convinced that the turn is at hand. One of these is now trying to place an order for 2000 tons for his own use this year, and is steadily refused at present prices. Manufacturers are refusing to book orders at ruling rates for anything but immediate delivery, the policy being to supply the trade from day to day.

To-day the only thing that stands in the way of a sharp advance of iron in the West is the capacity for production. It is not stocks on hand; it is not the actual production; it is the over-capacity that is in the leash ready to be let loose at the first sight of any game. If this can be controlled; if the production of the mills now running can be regulated, then iron will advance at once; and it looks as though these matters could be controlled.

The Commercial Value of a Good Name.

The idea that a man's worth was measurable by the amount of his wealth, was one of the inheritance of curses left us by our great civil war. During that period of national disturbance it was comparatively easy for a shrewd, unscrupulous, wide-awake man to acquire capital by other and much easier means than were open to any but men of exceptional abilities in the days of peace and normal prosperity. It was no uncommon thing for fortunes to be made in day, and thousands seemed to pass from comparative poverty to affluence by a single, bold, well-considered venture. Army contracts, sudden and sharp fluctuations in values, commercial speculations, operations in petroleum, gold and silver mining, railroad extension and real estate, and the enormously stimulated and indiscriminating demand for all kinds of products and commodities, placed the possibility of wealth within the reach of a very large class of men who had never before had the chance of acquiring capital by other means than the slow and laborious process of earning and saving it. The man who made money in those days, whatever the means by which he acquired it, was regarded as sharp, shrewd and enterprising: the man who did not make money was looked upon as a plodder—virtuous, it may be, but without enterprise. Success in any business covered a multitude of sins against the laws of God and man. The contractor who robbed the government of millions; the operator who organized a bogus company and filled his purse with the proceeds of worthless shares sold to credulous dupes; the business man who grew rich in illegitimate outside speculation—every one, in short, who could make a fortune and keep out of the meshes of the law, held his head high and received as his just due the homage which the world pays to success. When the war was over and the opportunities which grew out of it were no longer open to those who had profited by them, the wealth they had gained was employed in maintaining as long as possible the artificial conditions so favorable to all who held the belief that to reap where one had not sown was their proper occupation in life. Then began the era of wild and reckless speculation which culminated in the panic of 1873. That much of the easily acquired wealth of war times, based as it was upon fictitious valuations, was swept away or found permanent investment in worthless securities, affords but little consolation to those who deplore the mischief already done. The example of success is always alluring, but the lesson of failure is not so easily learned, and it will have been worth all it has cost us if the three past years of stagnation and depression have brought us to a realizing sense of the fact that there is something in life worth living for except wealth and its ostentatious display.

We do not doubt that there are many honest men throughout the country who have been sorely tempted during the past three years to sell honor for profit. They have seen rascality flourish, and have more than once wondered whether the honest man was not a fool, provided he let his honesty stand between him and gain. We have more than once heard merchants say that they considered it safer to sell to a man who had failed and compromised than to one who had not, as the former was more likely to have the money to pay his notes when they came due. If they have talked this way to their customers, it is no wonder that even honest men have paused to weigh the chances of honest success against those for profitable fraud.

That manufacturers and merchants have with almost one voice, agreed not to accept an offer of compromise in any case not calling for especial leniency, shows that the business community are awaking to the importance of purging trade of the cancerous malady which is so rapidly lowering the standard of commercial honor and poisoning the well springs of our national life. The rogues, the reckless speculators, the manufacturer careless of economy in his process or of excellence in his product, and the improvident, irresponsible tradesmen, have had their day. Now the honest man's turn has come, and if he still doubts the commercial value of a good name in business, it is because he has not as yet had occasion to test it. Perhaps our manufacturers and merchants who give credit have not befooled them, in their vigorous denunciation of dishonesty

"strike out for themselves" were equally strong; and with everything to gain and little or nothing to lose, thousands went into business and trusted to good luck and superior enterprise to carry them through.

As a consequence, the collapse of the bubble of a prosperity based largely upon an inflated currency and fictitious valuations

found the business of the country in a condition peculiarly favorable to widespread disaster. There was a solid and substantial foundation under all, but it was not broad enough to sustain the overhanging superstructure. Then began what is known as the "weeding out" process, and with it a worse demoralization than had been known before. The business man who found himself unable to meet his obligations was tempted to consider whether by "failing judiciously" he could not get more capital than he had ever had. Prompted by professional advisers, and guided by shrewd, unscrupulous legal advisers, thousands of merchants, manufacturers and tradesmen went before their creditors with skillfully prepared statements, and compromised their debts on the best terms they could get. Possessed of stocks costing them from twenty to forty cents on the dollar, low prices and dull trade made but little difference to them, and when it was necessary to replenish, they had the cash with which to buy until they had once more secured a line of credits. With this example before him, and compelled to face a competition which left no chance of profit, there was every inducement to the debtor with ample means to satisfy his obligations to venture the same experiment, and of the whole number of failures during the past three years a large percentage have been of a kind calculated to benefit the debtor in a business way. To the creditor the choice of alternatives has been a hard one. Under the existing bankrupt law the debtor has had the advantage. "This or bankruptcy" was his insolent ultimatum, and the creditor knowing that bankruptcy meant nothing for him, took the 25, 30 or 40 per cent, and congratulated himself on having secured that much. There is, however, a limit even to the easy, selfish good nature of creditors. The impression is gaining ground that failures have been altogether too easy, and discharges altogether too cheap. The "weeding out" has become much too thorough, and the time has come to deal sharply with dishonesty. No compromise with anyone who cannot show good and sufficient reason for his inability to pay is now the firm resolve of most of those who give credits. If a man has been unfortunate, or has become embarrassed from any cause beyond his control, be merciful, and give him a chance to

and shiftlessness, that good might result from the bestowal of a larger encouragement upon tried integrity and sterling honesty. It does not follow, however, that these are not appreciated. We are, to all appearance, on the eve of a substantial commercial revival—not a season of speculative excitement, but, we may hope, one of substantial progress, characterized by a nearer approach to a cash basis. In any case, there must and will be a more careful scrutiny of credits, and those who have come through the trial with a clean record will find a good name worth more than all the brief advantage which could have been gained by a departure from the paths of rectitude into the devious and uncertain ways of fraud. Out of the too general demoralization in trade has grown a larger appreciation of honesty and integrity, and those who have been indifferent to a good name in past years will now find that the homely old proverb of Poor Richard has, after all, a substantial basis of truth.

American Beam Engines.

A story of ante-war times has been recently brought to mind by some developments in English steamboat building. The incident happened in this wise: An American firm had built a steamer of our well known river pattern, to run upon one of the Chinese rivers. With the lighter wood work carefully secured, she crossed the Atlantic in the early summer, and ran along the African coast. When well up the east shore she ran into a British station for coal and provisions, and found there a river steamer of English build, with short stroke engines, below decks, and the usual fittings of boats of her class. The two steamers were of about the same size and bound for the same part of the world. A vertical beam engine at sea was then a genuine novelty, and the American vessel had many visitors from the station. The engineer from the other boat came and looked; his criticism was characteristic. The machine "was nothing but a blasted pumping engine afloat." "Well," said the Yankee engineer, "we will pump so much water astern with that same 'blasted pumping engine' that we will put you 'hull down' before nightfall." And sure enough, starting together from the harbor a day or two after, the boat was made good. By noon the English boat was so far astern that she was hull down, only the smoke stack being visible from the deck of the American. The American steamers sent out to those waters were fast, economical and comfortable. The engines, though of strange fashion, worked on year after year with small repairs and under all sorts of disadvantages. They were easily handled, and won their way against prejudice and in the face of cheaper engines and cheaper boats. Even in this day of compound engines, high expansion and quick piston speeds, it is a very good machine which can surpass the American vertical beam engines, such as are used on our river steamers. These engines are at last appreciated, and we read in the columns of one of the best English engineering papers that "two of the most notable of the paddle steamers built upon the Clyde last year" were of the American type. "They were the Kiang Kwang and Kiang Yung, each of 2500 tons and 250 horse-power nominal. They were built by Messrs. A. & J. Inglis for river service in China, and were preceded by six others which were built by the same firm and fitted with beam engines on the American system. These vessels have been eminently successful, and, indeed, they are the only vessels built in this country which have been able to compete with those sent out to the Yang-tze by the American ship-builders. They are generally of about 3000 tons gross measurement, and in them the American type has been closely followed, with the exception that the hull and engine framing are of iron instead of wood." According to the American method of rating an engine by the amount of power it will develop under normal conditions, these engines would be about 1500 horse-power.

It has been a prevailing notion in this country that in the line of marine engine building, etc., we were somewhat behind Great Britain. It is somewhat flattering, however, to learn that in another point our practice is being followed. In another part of the same article from which we have quoted, we find mention of the fact that upon the Clyde the practice during the last year has been tending toward the building of screw tugboats instead of paddle boats. Except for river towing, the paddle tug is a thing of the past and there are probably at the present moment not more than a dozen paddle boats in this harbor which are used for towing exclusively. These boats are mostly very fast, and are fitted with beam engines. They are used for transfer and similar services, the towing being rather incidental. The

largest of them, the Seth Low, can make 20 miles an hour, and is much used by regatta committees, etc. In power, the small and handy propeller is so far superior to the paddle boat that we wonder the latter have not long since been displaced on the other side of the water. What the state of the case is can be judged from the following sentences:

There is room to believe that a step in the right direction has been taken upon the Clyde in the construction of tugs to be worked by means of screw propellers rather than by paddle wheels, and in designing economical engines to actuate them. The latest effort in that direction is seen in the engines patented by Messrs. Rankin & Blackmore, and fitted into the screw tug Ottar, lately built by Messrs. Duncan & Co., for a Port Glasgow firm. Much interest is felt in the success of that effort in practical work.

The result is easy to be seen, the paddle will go out, as utterly as it has here, and the screw will come in.

In shipbuilding American fashions are very likely to be followed in England, and it would be no matter of surprise if American river steamers were found one of these days upon English inland waters. After the America's victory in 1851, the curved cut-water came into universal use among English shipbuilders. Then the American ocean steamers adopted the straight bow without the bowsprit; not long after the whole world built steamers with straight bows, and if we remember rightly, the only ocean steamers sailing out of this port that have bowsprits are one or two vessels of the Cunard line. Now we learn that, "Probably the most novel feature in connection with the art of building ships that has come under notice on the Clyde during the last year or so, is that of employing four masts upon large sailing vessels instead of three, as a means toward lessening the risk of dismasting at sea, as also for convenience of working such ships," which is somewhat of a surprise, since Donald McKay built a four masted clipper ship years ago in Boston, and we had always supposed he was entitled to the credit of it, as he did it some many years ago, but it seems that "this improvement was first introduced by Messrs. Barclay, Curle & Co., into the 'County of Peebles,' a large sailing ship which they built for a Glasgow firm in the year 1875. For the same firm they have since built two duplicates of that vessel." Four masted ships were built in this country at least 25 years ago, so our friends are again following our examples, and in the right direction too.

Testing Iron and Steel.

On the 30th ult. the President sent the following message, upon the subject of testing iron and steel, to Congress:

I desire to call the attention of Congress to the importance of providing for the continuance of the board for testing iron, steel and other metals, which, by the Sundry Appropriation act of last year, was ordered to be discontinued at the end of the fiscal year. This board, consisting of engineers and other scientific experts from the army, the navy and from civil life—all of whom, except the secretary, give their time and labors to this object without compensation—was organized by authority of Congress in the spring of 1875, and immediately drafted a comprehensive plan for its investigations, and contracted for a testing machine of 400 tons capacity, which would enable it to properly conduct the experiments. Meanwhile the sub-committee of the board have devoted their time to such experiments as could be made with smaller testing machines already available. This large machine is just now completed and ready for erection at the Watertown Arsenal, and the real labors of the board are therefore just about to be commenced. If the board is to be discontinued at the end of the present fiscal year the money already appropriated and the services of the gentlemen who have given so much time to the subject will be unproductive of any results.

The importance of these experiments can hardly be overestimated when we consider the almost endless variety of purposes for which iron and steel are employed in this country, and the many thousands of lives which depend on the soundness of iron structures. I need hardly refer to the recent disaster at the Ashtabula bridge, in Ohio, and the conflicting theories of experts as to the cause of it, as an instance of what might have been averted by a more thorough knowledge of the properties of iron and the best modes of construction. These experiments cannot properly be conducted by private firms, not only on account of the expense, but because the results must rest upon the authority of disinterested persons. They must therefore be undertaken under the sanction of the government. Compared with their great value to the industrial interests of the country, the expense is very slight. The board recommend an appropriation of \$40,000 for the next fiscal year, and I earnestly commend their request to the favorable consideration of Congress. I also recommend that the board be required to conduct their investigations under the direction of the Secretary of War, and to make full report of their progress to that office in time to be incorporated in his annual report.

U. S. GRANT.

EXECUTIVE MANSION, Jan. 30, 1877.

This is timely. The importance of the work is great, while it is of such a character that we can only look to the government to carry it on. Every day demonstrates the need we have of a greater knowledge of the properties of iron and steel, when manufactured in large masses. Materials which show most extraordinary powers of endurance in one form are often weak in another; changes of structure take place and a variety of phenomenon occur for which we are at a loss to account or interpret. The labors of the board will give us what we want, and there is little doubt

but the needed funds will be appropriated by Congress.

Steel Rails.

We learn from the report of the Massachusetts State Commission on Railroads that during the past year 151 miles of steel rails have been laid in that State, making 1144 miles out of a total 3104 miles, or 37 per cent. of the whole. Everywhere the steel rail seems to be displacing iron, except perhaps in those instances where the head of the iron rail is exceptionally hard, and then one seems to wear as well as the other. Wherever there is a heavy traffic, or where the weight upon a pair of wheels exceeds a given amount, steel must sooner or later come into use. The wheel of an engine or car bears upon a very small surface, and the crushing force per square inch is often far greater than the head of the best iron rail is capable of resisting. In such a case lamination begins at once. The surface of the rail is destroyed wherever the wheel touches, and the destruction is rapid and certain, even though the rail itself be amply able to sustain the load. If, however, the rail head is sufficiently hard to resist the crushing action at the point of contact between the wheel and rail, lamination is entirely stopped and the wear of the rail from other causes is exceedingly slight. An example of the difference between hard and soft metal is often seen in the wheels under engines, the soft tires wearing with exceeding rapidity simply by the breaking down of the structure of the metal under the pressure of the wheel, and the steel wearing admirably on account of its greater resistance to crushing.

Single Acting Engines.

No little attention is just now being paid in England to the single acting engine with from two to four cylinders. Perkins was, we believe, one of the first who used the single acting cylinder to obtain a high degree of expansion and economy with high pressure steam. Some of his engines, we believe, had more than four cylinders arranged in a line. The cylinders in the more common forms are arranged radially around the shaft. One inventor places them parallel to the shaft, however. The speeds are very high, and the power obtained from a small machine is consequently great, in spite of the fact that the cylinders are single acting. There being no piston rods nor guides, and but three moving parts to each cylinder, counting the valve connecting rod and piston, the construction is very cheap. As considerable measures of expansion are obtainable and the engine is very compact, they seem to be very promising. Several firms are engaged in their manufacture. It is hoped that they will combine all the supposed advantages of the engines with the advantages of the ordinary reciprocating engine. The forms which have been brought out abroad are certainly worth careful study.

New Publications.

THE CARPENTERS' AND BUILDERS' ASSISTANT AND WOODWORKER'S GUIDE. By Lucius D. Gould, Architect and Practical Builder. A. J. Bicknell & Co.

Mr. Gould is well and favorably known as the author of the "House Carpenter's Assistant," and a new work by him on practical carpentry will be received with satisfaction as a valuable addition to the literature of house building. Practically, it is a revision of the earlier work, now out of print, with much valuable matter added. Among these additions we notice a new and easy system of lines, founded on geometrical principles, for framing the most difficult roofs; for cutting joints and finding the sections of angular pieces; for finding the form of a raking mold; for the mitering of circular moldings, etc., etc. We also find useful tables of weights and cohesive strength of building materials, with a treatise on the adhesion of nails, screws, iron pins and glue; also an easy system of stair railing for straight and platform stairs. The book will be found of great practical value to architects, builders and carpenters, and contains a very clear and concise presentation of the theory and practice of constructive carpentry. The work is well illustrated with plates and diagrams. It may be ordered through this office, as announced in our department of book advertisements.

DRAINING FOR PROFIT AND DRAINING FOR HEALTH. By Geo. E. Waring, Jr. Illustrated. O. Judd & Co.

Col. Waring's book is a practical treatise on the drainage of lands, which should be carefully read by all who own real estate not naturally well drained. The writer has had an extensive experience in this kind of engineering work, and what he has learned is presented with a clearness and power which gives the treatise an interest for all classes of readers. The book realizes the promise of its title, so far as relates to land drainage. The chapter relating to town and house drainage has but little practical value. It is chiefly a digest of English contributions to the literature of sanitary science, but if it adds nothing to the value of the book it certainly detracts nothing from it. The book may be had at this office, as announced elsewhere.

Better and Cheaper Steel.

We called attention in September to the exhibits and tests of the Fagersta steel and homogeneous iron in the Swedish Department at the International Exhibition. This metal was made by arresting the decarbonization of cast iron in Bessemer converter, the iron being run in from the hearth of a blast furnace; the iron having been prepared in the furnace by smelting a prescribed mixture of ores, so that the steely property was obtained by decarbonization and without the use of ferro-manganese, spiegeleisen or cast iron at the end of the Bessemer process.

A patent was granted in this country in 1865 to James Henderson for this process. It has not gone into use here yet, as the steel makers thought it could not be used at large works, but as it is in use at Seraing and Creusot they will find great inducements to adopt it. The steel made in this way is chiefly remarkable for its superior quality, and as the quality cannot be obtained by the use of spiegeleisen after decarbonization in the ordinary way, it is but fair to conclude that the quality is owing entirely to the process of preparing the iron in the blast furnace. Uniformity is the most valuable of its properties. In this respect it is better than the best kinds of Yorkshire iron, which are used in the specifications of engineers, and for strength and elasticity, combined with softness, it excels those kinds of iron and the steel made by the open hearth or Siemens-Martin process.

Bessemer steel made by the other method is so irregular in quality that it is generally considered unfit for any use than for rails. This is due to the irregular diffusion of the steely properties given to it by the spiegeleisen or ferro-manganese, and for uses where a trustworthy material is needed it is discarded and iron is used instead.

The following table of tests gives the extreme lowest and highest tests of the Fagersta soft steel or homogeneous plate iron, and plate iron of the celebrated Yorkshire makers, which are generally specified by British engineers, and which when used relieves everyone from legal responsibility as to quality of materials. The tests in both cases were made by Kirkaldy:

Fagersta		Yorkshire	
Homogeneous	Plate Iron.	Plate Iron.	Plate Iron.
Lowest.	Ultimate stress... 55,803 lbs. per sq. in.	40,412 lbs.	40,412 lbs.
Contraction of area	50.0 percent.	7.9 per cent.	7.9 per cent.
Stress per fractured area	111,608 lbs.	44,025 lbs.	44,025 lbs.
Elongation	.364 per cent.	6.7 per cent.	6.7 per cent.
Highest.			
Ultimate stress... 52,475 lbs.	54,515 lbs.	54,515 lbs.	54,515 lbs.
Contract. of area	61.7 per cent.	29.9 per cent.	29.9 per cent.
Stress per fractured area	163,108 lbs.	77,777 lbs.	77,777 lbs.
Elongation	.447 per cent.	20.9 per cent.	20.9 per cent.
Bulging stress.			
Un-cracked... all	33.3 per cent.		
Cracked or burst... none	66.6 per cent.		
Thickness... .500 inch	.508 inch.		
Bulged... .333 inch.	.280 inch.		
Ultimate stress... 164,580 lbs.	133,033 lbs.	133,033 lbs.	133,033 lbs.

The variation in quality from the lowest to the highest tests of the Fagersta homogeneous iron or steel is 46 per cent. per square inch of stress per fractured area, while with the iron plates it is 76 per cent. In the elongation or elasticity the Fagersta varies but 34 per cent., while the iron varies 300 per cent., or nearly ten times as much. That these tests of Fagersta iron are not exceptional was evidenced by the numerous certificates published by the Fagersta Company of different firms that use it.

Soft steel made at the Otis Steel and Iron Works by the Siemens-Martin process, the highest test of quality gave 144,444 lbs. per square inch stress per fracture, area; the ultimate stress was 49,000 lbs.

The process produces steel or homogeneous iron cheaper than any other, as the metal being taken from the hearth of the blast furnace to the converter saves the waste of remelting pig iron in a cupola, amounting to 5 per cent., and of extra cost of spiegeleisen and the waste of melting it, and the labor and fuel of the cupola, which in all amounts to about \$5 per ton of steel. The cost of manufacturing the ingot of steel by this process is merely the cast iron and waste of decarbonizing it and the labor and fuel attending the use of the Bessemer apparatus, but exclusive of interest, repairs and superintendence, which will be the same either process of making Bessemer steel.

The following extracts from the Henderson patent gives an explanation of the manufacture:

"My invention relates to an improvement in the manufacture of iron or steel by the pneumatic process, generally known as the Bessemer process, and my said invention consists in combining with the said pneumatic process for decarbonizing crude molten iron; the preparation of the crude molten iron to be thus decarbonized by mixing with iron ores and other materials, charged in the usual way at the tunnel head of the blast furnace, a given quantity of manganese, or by preference manganiferous iron ores, such as that known in this country by the name of red oxide of zinc, or Franklinite, known at present to exist in the greatest quantity in New Jersey, but other iron ores rich in manganese, such as spathose, or spathic carbonates may be used instead where they are free from sulphur and phosphorus, or any other iron ore in combination with manganese from which the metal known as 'spiegeleisen' may be made.

"The object to be gained by thus mixing in the blast furnace is that the manganese, or ores or metal containing manganese in sufficient quantity, may be smelted at the same time as the other ores with which the furnace may be charged, that there may be found combined with the iron in the state of fusion in the hearth of the blast furnace a sufficient quantity of manganese to insure its being in a fit state to be treated directly from the blast furnace by the pneumatic process for making steel from crude cast iron.

"The mode of procedure is to run the

molten iron from the blast furnace in the decarbonizing vessel, and then at once treat it by the pneumatic process; in every respect similar to the mode now practiced in what is known as the Bessemer process of making steel from crude iron by means of currents of air blown up through and among the metal.

"The quantity of manganese ores will vary with the quantity of manganese they contain, and the character of the other ores and materials with which they may be smelted. Very pure ores, such as the richer and better qualities of Lake Superior ores, or the red hematites of Cumberland and Lancashire, England, will require less than where ores of an inferior quality are used, and will necessarily depend on the skill of the workmen, assisted by frequent careful analyses of the materials used, all of which should be as free from sulphur and phosphorus as possible.

"The advantage of my said improved process is that the manganese, the presence of which in the pneumatic process of decarbonizing is known to be essential, if not indispensable, is more thoroughly incorporated with the molten iron than when introduced in the crucible in which the pneumatic process is operated, and being more thoroughly incorporated, and being present from the very beginning of the pneumatic process for decarbonizing, it exerts its beneficial influence more effectively than when introduced toward the end. When sulphur and phosphorus are found in the materials a larger quantity of manganiferous ore will be needed to overcome these deleterious substances, and the same rule will apply when there is an excess of silica in combination with the ores.

"All of the ores used in the smelting operations will be found to work better when reduced to about egg size. From the above explanation it will be seen that the principle upon which the invention is founded is the application of manganese or manganiferous iron ores to be operated upon or smelted with other iron ores in the furnace, so that when in the state of fusion it can be directly decarbonized and refined by the pneumatic process."

The claim is: "Mixing manganese or the equivalent thereof, with the ore or ores charged in the blast furnace for smelting, in combination with and to produce crude molten iron to be directly converted by the pneumatic process, substantially as and for the purpose specified."

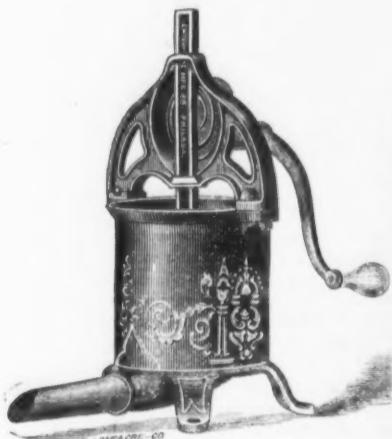
A mixture of ores and flux of the following chemical composition will give good results:

	Per cent.
Silica	3.9
Alumina	2.30
Lime	7.51
Magnesia	2.75
Protode of manganese	5.60
Iron	20.00
Sesquioxide	45.00
Phosphoric acid	.01

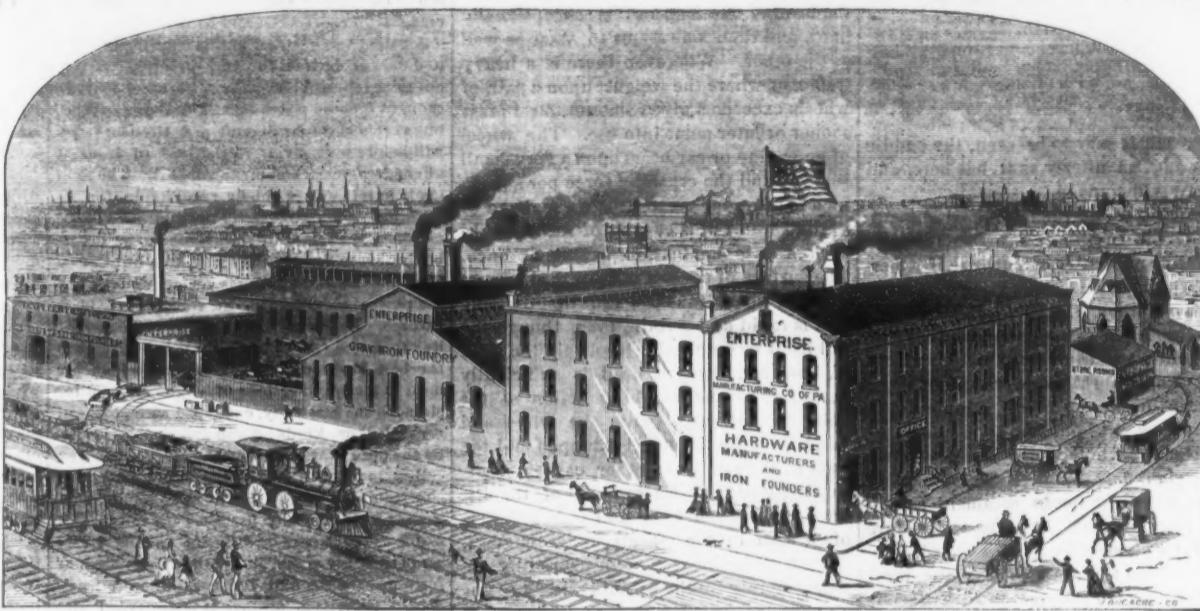
Works of ENTERPRISE MANUFACTURING CO. of PA.,

S. W. Cor. American & Dauphin Sts., Philadelphia.

PATENTED HARDWARE MANUFACTURERS.



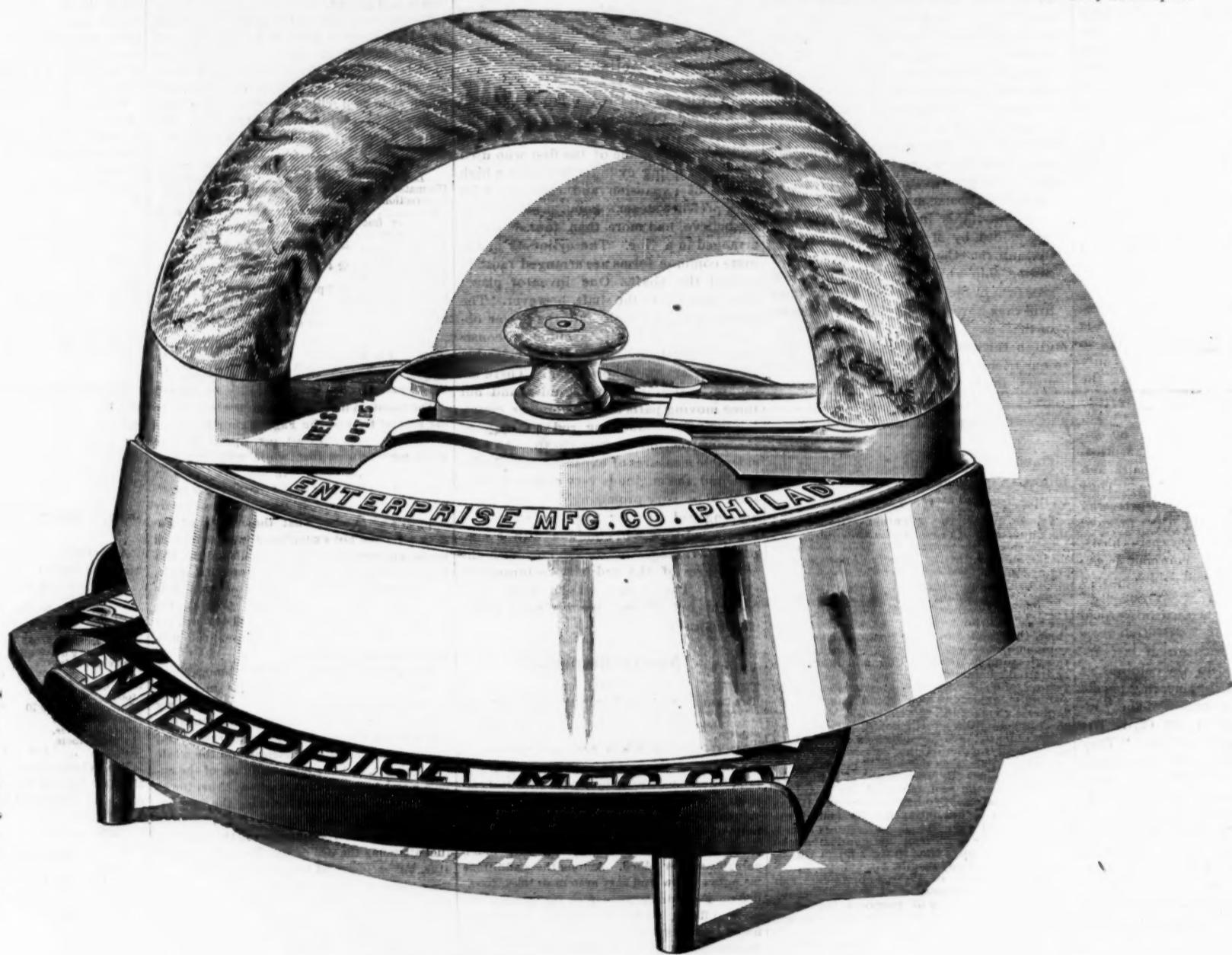
SAUSAGE STUFFER.—Closed.
Showing Sausage Stuffer, Fruit, Lard and Jelly Press closed.



SAUSAGE STUFFER.—Open.
Showing Sausage Stuffer, Fruit, Lard and Jelly Press open.

MRS. POTTS, COLD HANDLE, DOUBLE POINTED SMOOTHING AND POLISHING IRONS.

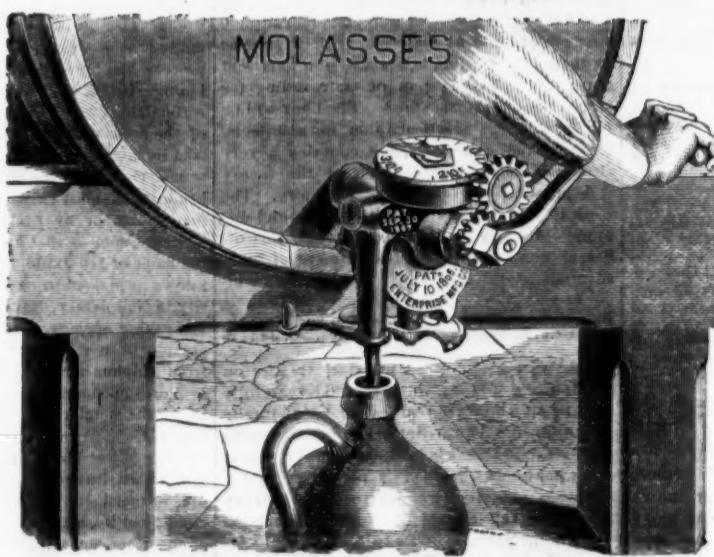
They require no holder or cloth, are lined with non-conducting tile enamel, and ground by patent improved machinery. They are of various sizes and price.



Three irons, one handle and a stand constitute a set. They are furnished either nickel plated or plain polished, as desired. These irons are patented both in the United States and Europe.



Star Iron with Perforated Handle not detached.



Patent Suction and Force Measuring Faucet.
Warranted to measure correctly, and draw a gallon of the heaviest molasses in winter in one minute.



Chinese Polishing and Glossing Iron, the best in the Market.

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Represented in New York by the WIEBUSCH & HILCER HARDWARE CO., Nos. 84 and 86 Chambers Street.

C. A. & W. L. TEAL,
No 4116 Ludlow Street, PHILADELPHIA, Manufacturers of
IMPROVED BOILER ROLLS, COMBINED PUNCHING AND SHEARING MACHINES,
SINGLE POWER PUNCHING MACHINES, with Shearing Attachments,
FISH-BAR PUNCHING MACHINES,

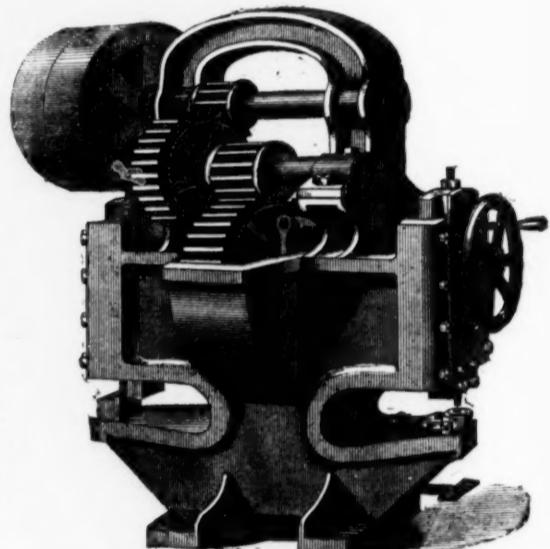
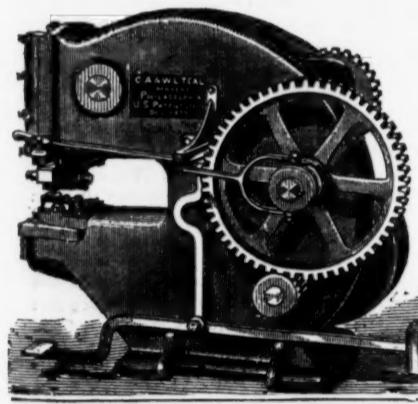
To punch four (4) holes and cut off the bar at one stroke.

Steam Riveting Machines, Boiler Makers' and Machinists' Post Drilling Machines,
AND MACHINERY IN GENERAL.

COMBINED PUNCH AND SHEAR.

Our regular pattern for boiler makers will punch and shear in the center of 40 inches, will punch $\frac{1}{4}$ inch hole in $\frac{1}{4}$ inch iron, and shear $\frac{1}{4}$ inch plate; is provided with an automatic stop motion for Punch "Head" that can be set by the operator to stop the punch at any point of the stroke; as for different thicknesses of iron the punch can be set to stop within $\frac{1}{4}$ of an inch of the iron after punching the hole, where it will rest until the work is adjusted for the next hole and the clutch thrown in. Is also provided with an adjustable stripper, a gauge and two "rests," one on each side of the die to support the work. Shears run while the belt is on the tight pulley, but the punch can be operated by the clutch. When desired, punch end of the machine is provided with heavy bolts, giving ten inches reach to center of punch, and will punch 1 inch hole in 1 inch iron. We also make this machine with 12 inches reach on punch end, to punch 1 inch hole in 1 inch iron, and with shears set on an angle for splitting sheets and cutting off bars.

Our small pattern for boiler makers will punch 18-16 inch hole in $\frac{1}{4}$ inch iron, 15 inches from the edge, and shear $\frac{1}{4}$ inch plate 15 inches from the edge, is made for either hand or steam-power or both.



COMBINED PUNCH AND SHEAR.

THE COWLES HARDWARE COMPANY, Unionville, Conn.
Manufacturers of HARDWARE AND HOUSE FURNISHING GOODS.

GEO. DUNHAM, Pres.

G. S. KNAPP, Treas.

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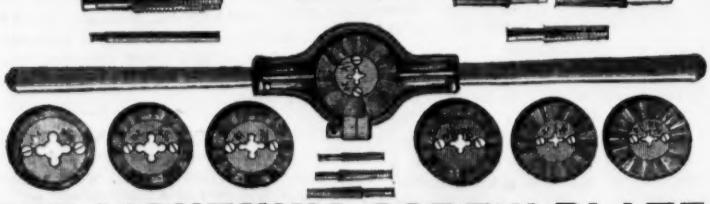
Screw Drivers of all varieties, Box Scrapers, Box Openers, Garden Hoes, Garden Trowels, Border Knives, Mincing Knives, Fish Turners, Butter Knives, Cake Turners, Cleavers, Hammers, Carpet Stretchers, Tack Claws, Marking Awls, Carpenters' Awls, Bell Awls, Ice Awls, Carpet Jacks, Nail Sets, Bush Holes, Ice Axe and Tonga, Recent Mouse Trap, Vegetable Slicers, Bit Braces, Bits and Spiral Screw Bits, Cork Screw, Cattle Leaders, Corn Hooks, Door Springs, Knives (Kitchen), Saw Sets (Hart's Patent), Saw Sets (Akron's Patent), Saw Sets (Improved Beach), Spoons (Table and Tea), Washers (Tin and Iron), Knob Rings a specialty, and IMPLEMENT SCREW DRIVERS. Catalogues and Circulars sent on application.

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SAMUEL G. B. COOK & CO., Agents, Baltimore, Md.

WILEY & RUSSELL MFG. CO.

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THE LIGHTNING SCREW PLATE.

Hand and Power Bolt Cutters and Pipe Threaders, Drilling Machines, Tire Upsetters, Fine Friction Clutches, &c., &c.

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Importers of and Dealers in

Stubs' Tools, Files, Bright Round Steel Wire, Bar & Sheet Steel, &c.

Best Piercing Saws for Scroll Sawing. French, German, English and American Tools, Files, Steel Wire and Supplies. Agents for the ALMOND DRILL CHUCK.

SNYDER'S LITTLE GIANT STEAM ENGINE

The Best

SMALL

POWER ENGINES
IN THE COUNTRY.

Manufactured by

WARD B. SNYDER,
94 Fulton St.,
NEW YORK.

One-Horse Power, with tubular boiler complete, only... \$150.

Two-Horse Power.... 200.

Three-Horse Power... 250.

Call and Examine
OR SEND FOR
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CATALOGUE.

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SAVED
AT
ASHTABULA!**

Eight of the victims of this terrible catastrophe were insured against accidents in

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OF HARTFORD, CONN.

Louis J. Barnard, Buffalo, traveling agent..... \$5,000

Henry Wagner, Syracuse, sleeping-car conductor..... 5,000

Edw. L. Russell, Auburn, N. Y., commercial traveler..... 5,000

Levi W. Hart, Akron, Ohio, commercial agent..... 5,000

Mr. Hart had also a Life Policy for..... 3,000

Samuel C. Hart, New York, commercial agent..... 5,000

Jonathan Rice, Lowell, Mass., merchant..... 4,000

G. A. Purlington, Buffalo, Adams Express messenger..... 2,000

F. W. Marvin, Buffalo, commercial agent..... 1,000

Total, so far as known..... \$45,000

Mr. Barnard's Accident Policy was written only two hours before his departure on the ill-fated train and cost \$37.50. The eight accident policies cost only \$250.00.

ACCIDENT INSURANCE, procured by the timely investment of very little money, brings incalculable relief to the increased and suffering in case of fatal casualty or bodily injury.

THE TRAVELER'S has paid in cash benefits to its Accident Policy holders over

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Every man, traveling or not, should secure the cheap and sure protection of a

Yearly General Accident Policy.

Any regular agent will write one at a few minutes notice.

New York Office, 207 Broadway.

The National Association of Stove Manufacturers.

Sixth Annual Meeting.

THURSDAY, January 18, 1877.

The meeting was called to order by the president at 10:30 a. m.

The President: I understand Mr. Boynton, of New York, is prepared to make some remarks or suggestions in regard to trade-marks. It would be agreeable to the Association to hear from Mr. Boynton at this time.

Mr. Eddy: Mr. President, with your permission and that of Mr. Boynton, I desire to say that two of our brethren were last evening called from us by the unexpected death of their father. I refer to the Hubbell brothers, of Buffalo, who have always been members of this Association, and joined with us upon these occasions. I move that the sympathies of this Association be extended to them in their affliction, and that the secretary be requested to convey the same.

The President: The president received the intelligence of the death of Mr. Hubbell from apoplexy, and the Messrs. Hubbell immediately returned to Utica.

Mr. Eddy's motion was then adopted.

Mr. Boynton: Mr. President, I have no particular remarks to make, only to say that Mr. Richardson conferred with our attorney, who drew up a little article embodying an amendment to the bill which was introduced in Congress. It is suggested that possibly this might be added to that bill. With your permission I will ask that the secretary now read it.

The secretary read the same, as follows: "That any person who shall, with intent to defraud, deal in or sell, or keep or offer for sale, or cause or procure the sale of, or manufacture or furnish for sale any goods or articles of merchandise which are substantially similar to material or operative part or parts of any goods or articles of merchandise to which is affixed any trade-mark registered pursuant to the statutes of the United States, for the purpose and with the intent that the same shall be incorporated therewith or used therein under said trade-mark, knowing the same to be counterfeit and not the genuine material or operative part or parts thereof, shall, on conviction thereof, be punished as prescribed in the first section of this act, and shall also be liable to an action in the case for damages therefor, at the suit of the owner of said trade-mark, in any court of competent jurisdiction in the United States; and the party aggrieved shall also have his remedy according to the course of equity to enjoin the same, and to recover compensation therefor in any court having jurisdiction over the person or persons guilty thereof."

Gen. Rathbone moved its reference to the standing Committee on Patents. Adopted.

Mr. Olaher: That reference to the committee cuts off any discussion, I understand. The gentleman on my left (Mr. Filley) desires to ask some questions in regard to it.

The President: We will consider ourselves under the "good of the Association" rule, and any remarks will be in order.

Mr. Filley: I would like to inquire whether the statement just made by Mr. Boynton would cover stoves other than those which are covered by a trade-mark? Now, there are many belonging to this organization having stoves not covered by a trade-mark upon which they might obtain a trade-mark patent provided they had a right to; but, as I understand it, there are none covered except those first covered by a trade-mark.

Mr. Boynton: In reply I would say that I suppose that depends upon how the term "trade-mark" is construed, or what constitutes trade-marks. I have here a comprehensive digest on trade-marks, and it has reference to Senator Conkling's bill. Our attorney fully understanding the scope of this new bill drew this up as an amendment to the bill, as the new law, in his opinion, did not quite cover what we wish to accomplish. I presume some members present have a copy of this. If not, I will leave it with the secretary.

Mr. Bush: At Cincinnati there are two small firms that have been taking our grates and using them as patterns, and issuing circulars that they would sell certain plates of our stoves for 3½ cents a pound. A committee was appointed by our local association to investigate the matter, and the subject was submitted to an able attorney, who has given his opinion that we can recover damages and put a stop to this wholesale thieving. There are small manufacturers who are making a living by stealing these patterns and offering to sell plates that belong to us.

Mr. Boynton: In New York a family consisting of several brothers have opened, or were to open this week, a store in Water street, under the name of the New York Repair Company. The object of their establishment is to supply repairs of all kinds for all kinds of stoves and furnaces. Their present price is 6 cents a pound. They think to evade the law by designating their articles by numbers. If a customer should ask them if they had a grate for "Splendid," they would say, "Oh, no; but we have a grate number 16 which will fit it and answer the same purpose." They have undertaken this scheme with an idea, evidently, of doing a thriving business.

The president suggested that if the passage of this amendment was desired, the committee should be instructed to push it. It left six months longer it would be too late for any action of the present Congress.

Upon motion of Mr. Warren, the committee was thus instructed.

Mr. Merriam: Is there any gentleman of the committee upon this subject here that can answer what the scope of the law is in relation to covering plates?

The President: The chair understands Mr. Boynton that the law requires amending in the opinion of his firm's counsel, and that this amendment covers the deficient point.

Mr. Boynton: It may be known to some of the gentlemen that something like a year ago, or possibly more than that, we commenced suit against several founders in New York and vicinity for filing up our plates and making castings, and supplying goods. It was at first thought by our attorney that we could not stop such manufacture, and that there was no law bearing upon this subject by which we could stop them. However, after looking the matter over and consulting with some of the judges in New York, the conclusion was arrived at that there were precedents in the old English law—from which our laws are derived—by which it could be done. We accordingly commenced proceedings and obtained injunctions restraining the founders from making repairs for our stoves. We have found one party ready to test the question. There are four brothers of them. And when we get a case about ready to come into court one brother sells out to his other brothers. Then we take the next brother and treat him in the same manner, and he sells out. But I believe they have got nearly to the end of the brotherhood. [Laughter]. I don't know what we may accomplish when we get through, but there seems to be good ground in the opinion of our attorney, and of several of the judges in our neighborhood, for believing that we have a good and equitable cause against them. But this new law is supposed to be defective so far as applicable to what we desire of it; hence the drafting of this article as an amendment, which it is presumed would be attached to the bill, and thus the law be amended without any great difficulty. Then, on the passage of that amendment our lawyer advises us that he will have no difficulty, he thinks, in restraining people from making such repairs.

Mr. Warren: I would ask who the Committee on Patents are at present?

The President: I have reappointed the previous committee, consisting of the following gentlemen: I. A. Sheppard, Philadelphia; Chas. Eddy, Troy; A. E. Chamberlain, Cincinnati; H. A. Richardson, New York; W. H. Tefft, Detroit.

Mr. Merriam expressed the hope that gentle men having any well defined views on this subject would confer with Mr. Eddy.

Mr. Eddy thought the reference improper, and that the Association should take the experience of Mr. Boynton and his counsel as a guide in their actions; he therefore moved that the bill be referred back to the counsel, as it would be impossible for the Committee on Patents to get any better light on the subject than that already furnished by Mr. Boynton.

Gen. Rathbone: I move its reference to that committee, and all they have done and all that has been done in the matter. This law, which seems defective, was secured by our Committee on Patents; at least they have taken a very decided interest in it. At the Philadelphia meeting, Mr. Richardson reported that in consequence of this law the manufacturers of New York had sold four times as many odd plates as before; that it had been a check upon those who had been in the habit of using plates, etc., as patterns.

Mr. Boynton said that Gen. Rathbone was laboring under a misapprehension. The law in itself had no reference to stove manufacturers, but was passed in the interest of champagne manufacturers to prevent counterfeits and imitations. It is thought by our counsel that this amendment will cover our branch of business, and the suits we brought were not brought under this law, but under old English precedents. There has been no case brought to a final termination. So far they have all, except in the case referred to, backed down and given it up.

The president suggested that Mr. Eddy's object could be accomplished by a motion directing the Committee on Patents to procure the passage of the amendment.

Mr. Merriam thought that these recommendations should be discussed at greater length.

Mr. Hill said it did not enter into the minds of the committee that there should be no compromise of an account. It was thought best to bring it up again after what has been said by the president. The stove business is done in a very loose manner, and there are many abuses in it which call for reform. He did not favor very harsh measures with unfortunate debtors, but thought the time had come when debtors should be given to understand that no man who could pay his debts would be allowed to compromise them.

Mr. Speer alluded to the action of the Association at Philadelphia on this question, and recommended that there should be no compromise with a debtor until his affairs have been sifted to the bottom. The adoption of this recommendation is all well enough, but we should conform to it strictly. For my part, I made up my mind two years ago not to compromise with any man unless he had met with a misfortune. I have carried out my purpose to the letter, and if a man has succeeded in making a compromise I have refused to sell him afterward. I think if all would act upon this plan we should have fewer compromises and much fewer failures.

Mr. Whitehead said it was formerly his practice to accept the first offer that was made by a debtor wishing to settle. Since the meeting at Philadelphia he had abandoned that policy, and when a compromise was offered had taken time to investigate the circumstances. One man who offered 37 cents, after investigation offered 50. We took the 50, but he never got any more stoves out of us.

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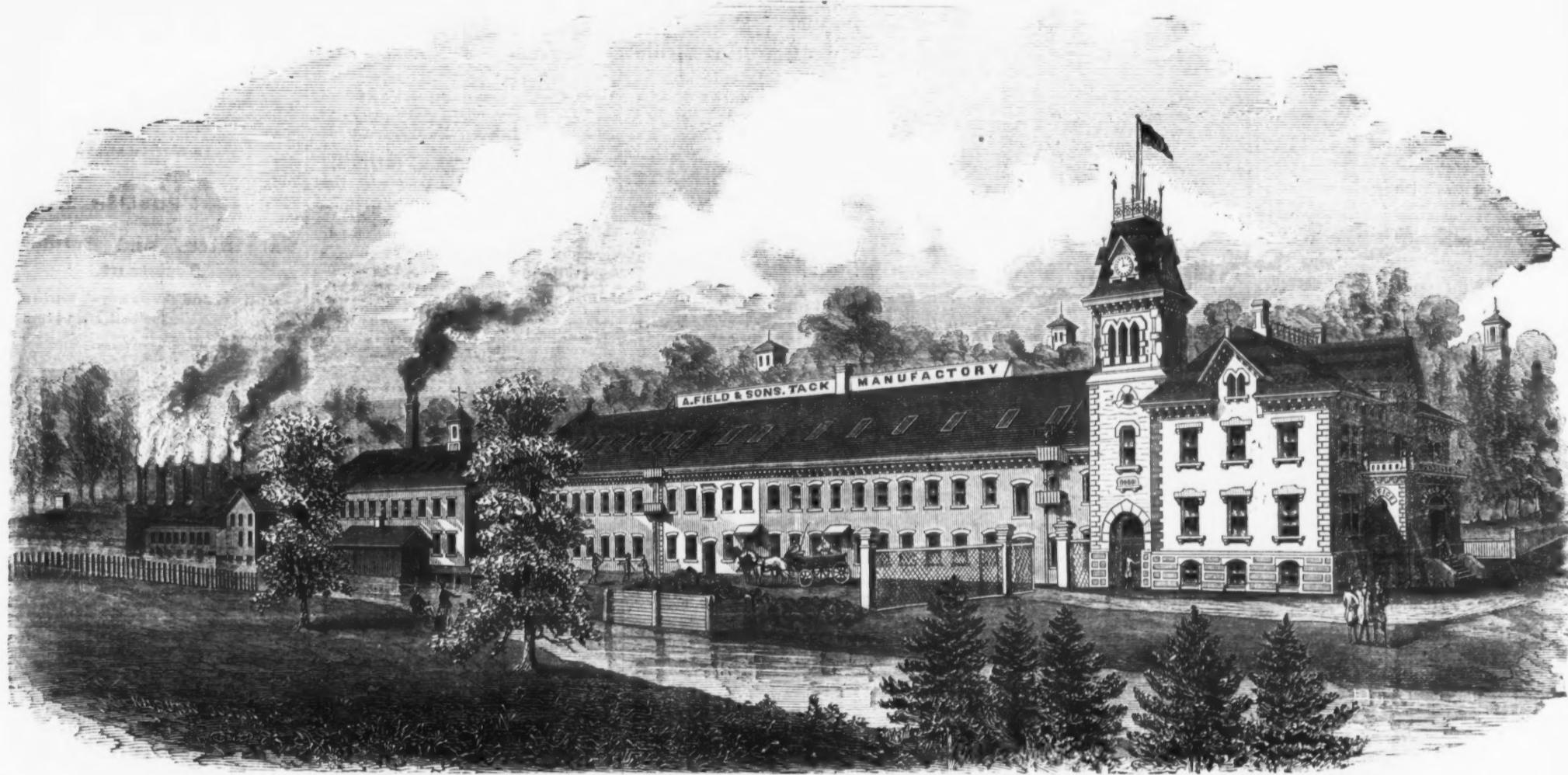
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Mr. Speer

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N. Y., January 17th, 1877.

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Tuesday and Wednesday, Feb. 13th & 14th, at 10 o'clock a. m., for Cash, over \$40,000 worth of first quality Table Cutlery, Carvers, Butcher Knives, &c., being the production of the above leading manufacturers, and comprising from 3000 to 4000 gross Table Cutlery, together with a large line of Carvers and Butcher Knives. The sale will be permanent, and the entire quantity sold, at the quotations offered by us, to be withdrawn from the market. This sale will be made in lots to suit large and small buyers, and the well known character of the manufacturers is a guarantee of the quality of the goods. The variety of styles and patterns will be such as to meet the demands of the trade in all sections, and the sale will be in every respect worthy of your attendance.

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One "Davy Bro's" 1200 lb. Steam Hammer. Three 21 inch swing "Pond" Drills. Three 4 Spindle Drills. One 5 ft. Radial Drill. One 2 Spindle Profiling Machine. Three Common Milling Machines. One No. 3 Smith & Garvin Milling Machine. One No. 4 Smith & Garvin Milling Machine. One Brown & Sharpe Universal Milling Machine. One Mason Milling Machine. One Crank Planer. One 2000 lb. Ferris & Miles Steam Hammer. Two 33 in. swing 15 ft. bed Lathes. One 20 in. swing 10 ft. bed Lathes. One 20 in. swing 8 ft. bed Lathes. One 26x26 ft. Planer. One 21 in. Sinking Machine. One 24x34 ft. Planer. One 21 in. swing 8 ft. bed Lathe. One 15 in. swing 6 ft. bed Lathe. One No. 4 W. M. car of Gou. M. Philadelphia. One Wood, Light & Co. combined Shaping and Slotting machine.

The above tools have been little used, will be sold very low and can be seen at the store of

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Letters Patent No. 42,786, for improvements in machinery for picking the heads of wood screws, granted to H. A. Harvey, May 17th, 1864.

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I am prepared to make arrangements with Eastern manufacturers to act as their agent for the sale of Hardware, etc., on the Pacific Coast.

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1614 Mt. Vernon St., Philadelphia.

One Wood, Light & Co. combined Shaping and Slotting machine.

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FOR SALE, on easy terms, a Machine Shop, Foundry and Boiler Shop, together with their entire equipment and supplies. The entire property will invoice about \$30,000, title perfect; or the entire may be exchanged for a wholesale stock of Hardware and Cutlery, or a general assortment of Iron and Nails, on fair terms. Location as good as any in the State. For particulars, address,

E. T. HAINES, Muncie, Ind.

Engagement Wanted.

A business man of large experience in manufacturing and trade, accustomed to the management of men and works, desires an engagement in any branch of business or industry. References of the most satisfactory character given.

Address J. E. G.,

Office of *The Iron Age*, 10 Warren St., N. Y.

CONSUMES THE BLACK SMOKE.

Saves Coal, Saves Waste of Iron, and Consequently Saves Money.

Gilmore's Improved Double Grate Reverberatory Furnace

For Puddling, Bolling, Boshelling or Reheating Iron. Its thorough efficiency apparent on examination, and **two years practical test proves it will do what is claimed for it.** Adds but little to first cost, or may be applied to old furnaces, and any furnace can work it without special instruction.

No prudent forge or mill management can afford to be without it.

Royalty, \$100 for each furnace per annum, or one-tenth of actual savings, as may be preferred by the user. Address

H. H. GILMORE, Patentee,

Sup't. Boston Rolling Mills,

Cambridgeport, Mass.

Situation Wanted.

An experienced Bookkeeper, who has been employed for the last six years in one of the largest Jobbing Hardware Houses in Central New York, desires a situation. Is married, and not afraid to work. Would locate anywhere, if salary were satisfactory. First class references furnished.

Address G. B.,

Office of *The Iron Age*, 10 Warren St., N. Y.

Situation Wanted

as Bookkeeper, Salesman or Traveling Agent, by a man who has been in Hardware Jobbing and Retail Trade in above capacities, for sixteen years.

Trade Report.

Office of THE IRON AGE.

WEDNESDAY EVENING, JAN. 31, 1877.

During the past week there has been a decidedly good feeling in Wall street. The events of greatest general interest have been the Treasury call for \$10,000,000 more of 5-20 six per cent. bonds, the decline of gold, and the further heavy decline in coal shares. The local money market has been easy, with rates to borrowers on call at 4 per cent., and on prime business paper 4 1/2 @ 6 per cent.

The decline in gold to 105 1/4, the lowest price since June 13, 1862, resulted in part from the calling in of bonds, and in part from the semi-official utterances of President Grant to the effect that the remaining \$230,000,000 4 1/2 per cent. bonds will be issued as rapidly as they can be handled by the Treasury clerks, and that specie payments can and will be brought about by the first of the coming March. It is probable that the President was not correctly reported in this last statement, for it is preposterous to suppose that the Treasury, which now has about \$30,000,000 of gold available for resumption, and which should have at least \$100,000,000 so available, can begin resumption on March first; particularly as it is impossible to get \$70,000,000 gold into the Treasury within the next 30 days.

The fluctuations in the gold premium since our last report are shown in the following table:

	Highest.	Lowest.
Thursday.	109 1/2	106 1/2
Friday.	109 1/2	106 1/2
Saturday.	109 1/2	106 1/2
Monday.	109 1/2	106 1/2
Tuesday.	105 1/2	105 1/2
Wednesday.	105 1/2	105 1/2

Government bonds have been firm, but have been unable to resist the steady decline in gold. The call of \$10,000,000 bonds is confined to the bonds known as 101 1/2, and after it is satisfied about \$80,000,000 of this class of bonds will remain outstanding. The call was made at the request of the Syndicate, which body, it is assumed, have a market for \$10,000,000 more 4 1/2 per cent. bonds; this makes \$17,000,000 of 20s called in at their request. The call is the thirty-eighth issued by the Treasury.

The stock market has been alternately strong and weak, but prices have manifested a decided tendency to follow the lead of the coal stocks. The decline in the coal stocks and bonds was started by the fall in coal, which at the auction sales during the week touched lower prices than were made last summer after the breaking up of the combination. This decline in the price of coal weakened all coal securities, and was construed as imperiling the very existence of the companies most embarrassed, to wit: the New Jersey Central and the Philadelphia Reading.

The principal dealings of the operators have been in the stocks which usually display the greatest speculative activity.

The following is a comparison of the averages of the New York banks for the past two weeks:

Jan. 20.	Jan. 27.	Differences.
Loans.....	\$252,411,900	253,156,100
Specie.....	40,974,900	40,187,000
Legal tend's.	40,128,800	42,251,200
Deposits.....	227,342,800	230,625,600
Circulation.....	15,491,900	15,493,900

The movements in foreign trade for the week are shown in the following tables:

IMPORTS.

For the week ended Jan. 30:

	1875.	1876.	1877.
Total for week.....	\$6,750,253	\$5,406,869	\$5,641,431
Prev. reported. 19,087,884	24,294,115	17,441,061	

Since Jan. 1, \$25,838,137 \$27,700,984 \$23,082,492

Among the imports of general merchandise were articles valued as follows:

Quant.	Value.
Brass goods.....	9 2,285
Bronzes.....	7 2,668
Cables and Anchors.....	43 1,543
Copper.....	172
Cuinery.....	59 18,597
Iron, plz. tons.....	5 2,540
Iron, plz. tons.....	80 2,739
Iron cotton trees.....	132 338
Iron ore, tons.....	510 1,004
Iron, other, tons.....	46 583
Metal goods.....	88 10,997
Nickels.....	13 3,200
Nickel old metal.....	1 196
Plating.....	3 3,838
Plated ware.....	125
Steel.....	11 293
Silverware.....	3 201
Tin, boxes.....	13,436 80,769
Tin, 1,550 slabs.....	80,339 13,938
Wire.....	1 508

EXPORTS EXCLUSIVE OF SPECIE.

For the week ended Jan. 30:

	1875.	1876.	1877.
Total for the week.....	\$5,679,073	\$5,098,396	\$5,355,160
Previously reported. 16,744,402	19,902,541	23,813,502	

Since Jan. 1, \$42,423,475 \$25,000,987 \$29,348,662

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Government bonds at the close were quoted as follows:

Bid.	Asked.
U. S. Currency 6s.....	123 132 1/2
U. S. 6s 1881, reg.....	112 1/2
U. S. 6s 1881, cou.....	113 1/2
U. S. 6s 1885, reg.....	108 108 1/2
U. S. 6s 1885, cou.....	108 108 1/2
U. S. 6s 1885, new reg.....	110 110 1/2
U. S. 6s 1885, cou.....	109 1/2 110 1/2
U. S. 6s 1887, reg.....	112 1/2 113 1/2
U. S. 6s 1887, cou.....	112 1/2 113 1/2
U. S. 6s 1888, reg.....	116 116 1/2
U. S. 6s 1888, cou.....	113 1/2 114 1/2
U. S. 10-40 reg.....	110 1/2 111 1/2
U. S. 5s 1881, reg.....	111 1/2 111 1/2
U. S. 5s 1881, cou.....	111 1/2 111 1/2
U. S. 4 1/2s 1891, reg.....	106 1/2 107 1/2

The following are the closing quotations of active stocks:

	Bid.	Asked.
Atlantic and Pacific Telegraph.....	15 1/2	16 1/2
Chicago & Northwestern.....	35	35 1/2
" Preferred.....	10	10 1/2
Chicago, Rock Island and Pacific.....	101 1/2	102 1/2
" Preferred.....	110 1/2	111 1/2
Col. Chic. & Ind. Cent.....	2 1/2	3 1/2
Cleveland and Pittsburgh.....	92 1/2	93
Chicago & Alton.....	101 1/2	102
Duluth, Lack. & Western.....	69 1/2	69 1/2
Illinois Central.....	69	69 1/2
Kansas City.....	104	104 1/2
American Express.....	47	47 1/2
United States Express.....	49 1/2	50
Wells, Fargo & Co. Express.....	84	85
Erie.....	9 1/2	9 1/2
Harlem.....	140	142
Hannibal & St. Joseph.....	12 1/2	13
" Preferred.....	25 1/2	26 1/2
Illinois Central.....	51 1/2	51 1/2
Lake Superior.....	54 1/2	55 1/2
Michigan Central.....	80 1/2	90 1/2
Milwaukee & St. Paul.....	18 1/2	18 1/2
" Preferred.....	48	48 1/2
Marquette.....	5 1/2	5 1/2
" Preferred.....	5 1/2	6 1/2
New York Central.....	101 1/2	102 1/2
New Jersey Central.....	25 1/2	26
Ohio & Mississippi.....	6 1/2	7
Quicksilver.....	24 1/2	25
" Preferred.....	11 1/2	16
St. L. Kan. City Northern.....	4 1/2	5 1/2
" Preferred.....	24 1/2	25 1/2
Tob., Wahab & Western.....	6	6 1/2
Union Pacific.....	64 1/2	64 1/2
Western Union Telegraph.....	75 1/2	75 1/2

GENERAL HARDWARE.

There is a decided improvement in the tone of the market this week, and we hear of considerable inquiry regarding prices. Few of the larger buyers from the West and South have visited our market, but in their absence a good deal of business by letter and from commercial travelers is being received.

Altogether the feeling in the trade is of a much more hopeful nature than at our last writing, and while few are so sanguine as to expect a large business during the spring months, many who are in a position to feel the pulse of the trade believe that, notwithstanding the disturbing influences which have been at work, the coming season will witness considerable commercial activity.

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Silverware.....	3 201
Tin, boxes.....	13,436 80,769
Tin, 1,550 slabs.....	80,339 13,938
Wire.....	1 508

EXPORTS EXCLUSIVE OF SPECIE.

For the week ended Jan. 30:

	1875.	1876.	1877.
Total for the			

394, Trace Chains, Wrought Swivel, ordinary quality—	6½, 8, 2	6½, 10, 2
Per pair.....	\$0.56	.57
7, 8, 2	7, 10, 2	
Per pair.....	\$0.60	.62
Add: Trace Chains, Domestic, Straight Link—		
6½, 10, 2	6½, 10, 3	7, 10, 2
Per pair.....	\$0.53	.52
Trace Chains, Walker's—		
7, 8, 1	7, 10, 1	7, 8, 2
Per pair.....	\$0.78	.77
7, 10, 2	7, 12, 2	7, 14, 2
Per pair.....	\$0.71	.78
7, 16, 2	7, 18, 2	7, 20, 2
Per pair.....	\$0.97	1.08
7, 8, 3	7, 10, 3	7, 12, 3
Per pair.....	\$0.61	.65
7, 14, 3	7, 16, 3	
Per pair.....	\$0.79	.88

"WESTERN" FILES.

New and Revised Price List, January, 1877.

Inch.	Bastard.	2d Cut.	Smooth,
To 4.	\$1.40	\$1.40	\$1.75
5.	1.60	1.85	2.10
6.	1.85	2.20	2.50
7.	2.20	2.60	3.00
8.	2.60	3.05	3.50
9.	3.00	3.65	4.15
10.	3.65	4.40	4.90
11.	4.25	5.10	5.70
12.	5.25	6.00	6.60
13.	6.10	7.00	7.70
14.	7.30	8.25	9.00
15.	8.75	9.75	10.50
16.	10.50	11.50	12.50

Half Round.

Inch.	Bastard.	2d Cut.	Smooth,
To 4.	\$1.60	\$1.80	\$2.00
5.	1.90	2.15	2.40
6.	2.25	2.55	2.80
7.	2.65	3.00	3.30
8.	3.10	3.50	3.90
9.	3.60	4.10	4.60
10.	4.25	4.75	5.25
11.	5.00	5.50	6.10
12.	5.75	6.40	7.00
13.	6.75	7.70	8.60
14.	8.00	9.10	10.30
15.	9.50	10.70	12.10
16.	11.25	12.50	14.00

Taper Saw Files.

Inch. Single Cut. Tapers.

To 3.....: \$0.95

3½.....: 95

4.....: 1.08

4½.....: 1.20

5.....: 1.35

5½.....: 65

6.....: 1.93

7.....: 2.40

8.....: 3.00

9.....: 3.90

10.....: 5.00

11.....: 6.10

12.....: 7.25

Cabinet Flat and Plain Half Rd' d

Files & Half Rd' d

Horse Saw Shoe

Rasps. Rasp.

Files. Rasps.

6.....: \$2.55

7.....: 3.50

8.....: 3.50

9.....: 4.00

10.....: 4.90

11.....: 5.70

12.....: 6.50

13.....: 7.70

14.....: 9.00

15.....: 10.00

16.....: 12.00

17.....: 11.00

Two per cent. extra discount for prompt cash, excepting goods marked * which are special net.

Blood's Scythes payable July 1st, less 5 per cent.

They have also issued the following:

CINCINNATI, January 1, 1877.

Having purchased the machinery and stock of the Cincinnati Bolt Works, of this city, we shall continue the manufacture of the Philadelphia pattern Bolts, and will keep on hand a complete stock of these goods, which we guarantee first-class, both as to quality and finish.

We are also engaged in the manufacture of wrought iron goods and tools, such as Fire Shovels, Pokers, Crow Bars, Wedges, Picks, Hammers, Sledges, Grub Hoes, Mattocks, &c., &c., &c., and intend furnishing to our customers goods that will compare, as to quality and finish, with any made either in the East or West.

PERIN & GAFF MFG. CO.

103 West Pearl street.

We invite attention to the advertisement of the Rogers Cutlery Company, of Hartford, Connecticut, on the 11th page. This company make a specialty of Silver-plating on steel and other metals. We are informed that during the past two years they have had sufficient business to keep their full quota of hands constantly employed, and that owing to a steady increase in the demand for their goods they are increasing their productive capacity. They quote Silver plated Spoons discount 50 per cent., and Table Cutlery at the net prices of the Cutlery Manufacturers' Association.

Among changes in business we notice the dissolution of the old firm of Whitaker, Phillips & Co., of Toledo, O., dating from January 1, and the formation of a new co-partnership under the style of Whitaker, Haynes & Co., who will conduct a general Hardware business at their old stand. The new firm is composed of the following gentlemen: J. H. Whitaker, Harry Haynes, G. H. Whitaker.

BRITISH IRON MARKET.

(Specially reported by cable for The Iron Age.)

WEDNESDAY, Jan. 31, 1877.

Scotch Pig.—The market has been somewhat depressed since last report, but has recovered again, and prices are steady. We quote, as last week, makers' prices:

Coldness No. 1.....: 66, 6

Glenarmock No. 1.....: 62, 6

Eglinton No. 1.....: 58, 6

Manufactured Iron and Rails remain without change.

IRON.

American Pig.—In addition to the sales noted in our last, the Thomas Iron Company report 8000 tons No. 1 and 2 Foundry, for delivery during the season. Their price for large lots, season delivery, is \$18 for Gray Forge; \$19 for No. 2 Foundry, and \$20 for No. 1 Foundry. For small sales they quote a dollar higher. We do not hear of further large sales by other companies. With the exception of the large sales for season delivery, there has been little done, but an improved inquiry is noticed in many quarters. The fact that such a considerable quantity of Iron has been sold at less than current quotations, has had the effect of depressing the market, and the expectation is expressed by many that the prices at which these contracts have been made will soon be the regular quotations. Many good brands may now be bought at them. We quote: Foundry No. 1, \$20 @ \$21; Foundry No. 2, \$19 @ \$20; Gray Forge, \$18 @ \$19.

Scotch Pig.—There is absolutely no new feature to report. The stock continues small, and there is no improvement in demand. We quote: Glengarmock, \$27 @ \$27.50; Eglinton, \$20 @ \$21; Foundry No. 1, \$18 @ \$20; Gray Forge, \$18 @ \$19.

Antimony—Is but moderately active at 13c. @ 13½c., gold, as to brand. London remains steady at £3.

\$25 @ \$25.50; Carnbroe, \$26 @ \$26.50; Coltness, \$27.50 @ \$28.

Rails.—We note the sale of 2500 tons Steel, to be delivered here, on private terms. We quote \$48 @ \$50, at mill, for Steel, and \$35.50 @ \$37 for Iron.

Old Rails.—No new transaction to report. The quotation remains, \$20.

Scrap.—We continue to quote Wrought Scrap, from yard, \$26 @ \$27.

METALS.

Copper.—An important change has taken place in the general business aspect since our last report. The incubus of the political squabble has been removed by Congressional action in adopting the Compromise Bill, and business men now look into the future with confidence, which is all that is wanted, for it is notorious that the stocks of most metals in producers', dealers' and consumers' hands are quite moderate—nay, unusually so. This has special reference to Copper, which metal has been the subject of most extensive transactions since our last. Last week continued quite dull till about its close, when 300,000 pounds Lake Superior sold at 19c. Early the present week, however, about 6,000,000 pounds, being one-third of the Lake production during the first six months of the year, were sold by producers to Continental parties for export, supposed to have been at 19c., since when about 500,000 pounds sold at 19½c. @ 20c., and 100,000 pounds at 20c., spot, and February delivery. The market may now be quoted firm at 20½c., for spot, and 20½c., futures. Baltimore we nominally quote 20½c. Much will depend now upon accounts from our brass manufacturing regions. Should business improve there soon, a good many consumers would be induced or compelled to replenish their stock of the raw material, and as the arrivals by rail are delayed through the snow blockade, available Copper would not be easily procurable even at an advance on present rates. The position in Europe remains statistically unfavorable, but Wallaroo being scarce, and likely to remain so for some time, the users of Lake Copper there have not hesitated to buy here. The cable repeats the quotation of £82 for Best Selected, and £74 for Chilli Bars. There is a moderate demand for manufacturers, which we quote 31c. for Sheathing, and 32c. for Bolts and Braziers; New Yellow Metal Sheathing, 18½c. @ 19c.; and Yellow Metal Bolts, 26c. @ 28c., net cash.

Tin.—Cable advices, both from London and Singapore, are the reverse of encouraging, Straits at the former having declined to £73. 10/., while the latter quotes \$19.50 per picul, with an exchange of 4/3½. The dispatch from London adds: "Dull; holders press sales." The falling off in the shipments from the Straits in 1876 to Europe and America is counterbalanced in its effect by the increasing Australian output, and unless a great stimulus be given to general business in Europe next spring, also benefiting Tin, we do not see that there is anything to prevent Tin from declining to where it stood last year—£70 for Straits, or even to a lower figure. The unfavorable advices from Europe and the liberal supply here have caused some holders among us to evince greater anxiety to realize, and we are told that Straits sold as low as 16½c. gold. We quote large lines, in gold, as follows: Straits, 16½c. @ 17c.; English Refined, 16½c. @ 16½c.; do., Common, 16½c. @ 16½c., and Banco, 19c. @ 19½c., all gold. Of the latter the Netherland Trading Society is selling 18,000 slabs to-day, and we shall probably know the result to-morrow. **Tin Plates.**—More orders are coming in, and there is a stronger feeling in this article, of whose future we entertain the very best opinion. We quote, in large lots, gold, per box, ordinary brands, as follows: Charcoal Bright, \$6.75; do. Terres, \$6; Coke Tin, \$6, and do. Terres, \$5.50 @ \$5.62½. The total shipments to the United States in 1876 have been 1,433,248 boxes, against 1,455,568 in 1875; 1,241,637 in 1874; 1,297,935 in 1873; 1,385,643 in 1872; 1,471,330 in 1871; and 1,271,080 in 1870.

Lead.—Of Common Domestic 50 tons sold at 6½c., currency, but the tendency is upward since, and we quote the same now 6½c. @ 6¾c., currency. Select has sold at St. Louis at 6½c., currency, which is equal to 6½c., currency here, and even at this high figure there is more inquiry. Foreign remains quiet at 6½c. @ 6¾c., gold, nominally. The average price of good Soft English Pig in the English market in 1876 has been £21. 15. 9 per ton, against £22. 5/., £21. 8/., and £23. 2/., 6 in 1875; £23. 10/., 6 in 1874; £23. 5/., 6 in 1873; £23. 10/., 6 in 1872; £23. 5/., 6 in 1871; £23. 10/., 6 in 1870; £23. 10/., 6 in 1869; and 49,461 in 1868. This shows a remarkable increase. The export has been as follows: 36,001 tons in 1876; 35,505 in 1875; 36,713 in 1874; 32,010 in 1873; 44,330 in 1872; 44,449 in 1871; 47,802 in 1870; 48,365 in 1869; and 41,555 in 1868. The gradual decrease will not escape notice. Manufactured remains in limited request at 8½c. for Bar, 9c. for Pipe, and 9½c. for Sheet, less the usual discount to the trade.

Spelter and Zinc.—Owners of the favorite brands of Domestic Spelter decline to sell under 6½c., currency, delivered here, while less known makes may still be procured at 6½c. @ 6¾c., currency. The last serious revival in the demand for brass manufacturing purposes would send up prices at once, and if we are to trust indications, we are on the eve of some such return to livelier times in this metal. Of Foreign, 20 tons C. G. H. sold at 6½c., gold, which is a low figure. The remaining stock of Silesian is 40 tons, and we quote the same 6½c. @ 6¾

Other Descriptions.	£	£	£
Egypt	11,720	6,964	55,037
United States	19,490	13,761	216,819
British India	53,932	54,036	619,411
Australia	27,648	27,579	311,936
Other countries	90,173	90,387	1,299,159
Total	436,556	272,735	5,239,966

Brass, Manufactures of	Cwt.	Cwt.	Cwt.
(not being Ordnance)	7,848	6,992	93,492
COPPER—Unwrought.			
To Germany	2,543	3,476	41,083
Holland	4,307	2,818	38,867
Belgium	1,369	531	28,062
France	3,688	7,170	97,378
United States	420	720	10,156
British India	1,415	2,230	18,254
Other countries			
Total	18,733	16,945	234,175
Wrought.			
To Russia	808	776	25,113
Germany	1,206	531	10,638
Holland	402	146	5,156
France	442	14	1,156
Italy	744	530	5,664
Turkey	568	1,390	16,931
Egypt	2,925	260	6,980
United States	100	36	395
British India	14,198	5,019	77,639
Other countries	4,509	4,738	60,253
Total	23,422	13,423	216,044
Mixed or Yellow Metal			
Sheathing	24,064	23,932	254,451
Total Copper	61,258	55,300	704,670

LEAD.	Tons.	Tons.	Tons.
To Russia	31	776	9,150
Germany	103	79	1,284
France	95	...	1,793
United States	92	...	1,315
China and Hong Kong	1,036	904	10,364
British India	244	259	1,895
Australia	156	166	2,113
Other countries	417	358	8,063
Total	2,104	2,512	36,001

TELEGRAPHIC Wire and Apparatus.	£	£	£
Tin, Unwrought.	Cwt.	Cwt.	Cwt.
To Russia	156	414	14,687
Germany	613	435	9,383
France	1,508	1,481	56,665
Turkey	362	864	6,980
United States	2,294	559	14,245
Other countries	2,305	1,323	23,167
Total	7,188	5,074	99,941

ZINC OR SPELTER.	4,333	7,282	113,131
COAL, COKE, CINDERS, AND PATENT FUEL.	Tons.	Tons.	Tons.
To Russia	8,161	16,983	1,182,381
Sweden and Norway	5,299	70,557	1,156,885
Denmark	56	61,709	297
Germany	126,272	108,453	2,571,901
Holland	26,510	21,451	378,903
France	253,744	279,911	3,250,599
Spain and Canary	63,102	64,680	763,031
Italy	81,212	82,340	1,226,25
Turkey	13,755	28,046	294,214
Egypt	67,778	32,969	543,668
Brazil	26,166	14,709	327,084
Malta	32,946	29,150	298,858
British India	48,615	68,440	75,182
Other countries	245,598	233,691	2,945,538
Total	1,136,765	1,121,230	16,265,839

COAL, &c. for steamers engaged in foreign trade.	289,116	284,383	3,364,524
SCOTCH PIG IRON			

has been steadily quiet during the week which has just ended, and is now in a somewhat weaker condition as to makers' prices. The week's shipments have not been very large, although freights are unchanged. There are now 113,035 tons in Connal's stores at Glasgow, beside about twice that tonnage in makers' yards—facts which are pretty certain to keep down prices for a while.

Messrs. James Watson & Co. say that last week's shipments were 3454 tons, against 4980 in the corresponding week of 1876, warrants being 57/3, and makers' prices as follows:

No. 1.	No. 3.
G. M. B., at Glasgow	58.6
Gartsherrie	64.6
Clydeside	68.6
Summerlee	57.6
Langlosh	65
Carphouse	59.6
Calder, at Port Dundas	65
Glenzarknock, at Ardrossan	63/
Eglinton	59.6
Dalmellington	59.6
Shotts at Leith	64.6
Kinnedale at Boness	59/

The prices current of John E. Swan & Bros. (Limited), Glasgow, January 12th, gives Gartsherrie No. 1 at 64; Coltness No. 1, 6 3/4; Glenzarknock No. 1, 62/6, and Eglinton No. 1, at 59/.

CLEVELAND IRON TRADE.

The report of the Middleborough Chamber of Commerce for December, 1876, is so interesting a document that I have been tempted to quote from it much more freely than usual. It states that in pig iron the month's business was fairly active at improved prices.

In manufactured iron during the first three weeks trade was brisk in all departments except that of rail making, but about Christmas business was almost suspended. In Christmas week the mills and forges were mostly closed. Prices have crept up, especially for shipbuilding iron, until they are now all 5/ per ton higher than at the beginning of the month.

In engineering, iron founding, &c., an average demand has prevailed, and the wire, cut nail, engineering, iron founding and tube works, were until the holidays kept regularly going. Iron founders who produced pipes and general castings were better off than the chair makers, but there was a slight improvement in this branch also. A new pipe foundry is to be erected by Middleborough capitalists, near the Yorkshire Tube Works. Shipbuilders have been kept well occupied, and orders are on hand sufficient to keep the yards busy for some months. The Slag Working Company have experienced a large demand for their productions recently, more especially for cement concrete. A firm is just about to open works at Middleborough for galvanizing iron tubes, cut nails, etc.

In the price list annexed the quotations are:

FINISHED IRON.	Per ton.
Bars, common, ordinary sizes	£ 6 10/ 0 to £ 6 15/ 0
Bars, best	7 0/ 0 to 7 5/ 0
Ship plates	8 0/ 0 to 8 5/ 0
Boiler plates	8 5/ 0 to 9 10/ 0
Angle, T and bulb iron	6 17/ 0 to 7 0/ 0
Rails, heavy sections	5 17/ 0 to 6 6/ 0
Rails, light sections	6 0/ 0 to 6 15/ 0
Puddled bars	4 10/ 0 to 4 15/ 0
Wagons at works, 4 months' bill, or cash, less 2 1/ 2 per cent.	

Cast iron girders, plain, per ton, £5.15/ to £6.15/ ; cast iron chairs, £3.7/ 6 to £4.4/ ; cast iron pipes, 1 1/ 2 in. to 2 1/ 2 in., £6 to £6.5/ ; 3 in. to 4 in., £5.12/ 6 to £5.15/ ; 5 in. to 5.7/ 6 to £5.10/ ; 6 in. to 24 in., £5.5/ to £5.7/ 6 to £5.7/ 6 to £6 to £6.5/ ; 7 in. to 17 1/ 2 in., £6 to £6.5/ ; 8 in. to 17 1/ 2 in., £6 to £6.5/ ; 9 in. to 17 1/ 2 in., £6 to £6.5/ ; 10 in. to 16 in., £5 to £5.5/ ; 12 in. to 18 in., £5 to £5.5/ ; 15 in. to 21 in., £5 to £5.5/ ; 18 in. to 24 in., £5 to £5.5/ ; 25 in. to 31 in., £5 to £5.5/ ; 32 in. to 38 in., £5 to £5.5/ ; 40 in. to 46 in., £5 to £5.5/ ; 48 in. to 54 in., £5 to £5.5/ ; 56 in. to 62 in., £5 to £5.5/ ; 64 in. to 70 in., £5 to £5.5/ ; 72 in. to 78 in., £5 to £5.5/ ; 80 in. to 86 in., £5 to £5.5/ ; 88 in. to 94 in., £5 to £5.5/ ; 100 in. to 106 in., £5 to £5.5/ ; 112 in. to 118 in., £5 to £5.5/ ; 120 in. to 126 in., £5 to £5.5/ ; 132 in. to 138 in., £5 to £5.5/ ; 144 in. to 150 in., £5 to £5.5/ ; 156 in. to 162 in., £5 to £5.5/ ; 172 in. to 178 in., £5 to £5.5/ ; 184 in. to 190 in., £5 to £5.5/ ; 196 in. to 202 in., £5 to £5.5/ ; 212 in. to 218 in., £5 to £5.5/ ; 224 in. to 230 in., £5 to £5.5/ ; 236 in. to 242 in., £5 to £5.5/ ; 252 in. to 258 in., £5 to £5.5/ ; 264 in. to 270 in., £5 to £5.5/ ; 276 in. to 282 in., £5 to £5.5/ ; 288 in. to 294 in., £5 to £5.5/ ; 300 in. to 306 in., £5 to £5.5/ ; 312 in. to 318 in., £5 to £5.5/ ; 324 in. to 330 in., £5 to £5.5/ ; 340 in. to 346 in., £5 to £5.5/ ; 352 in. to 358 in., £5 to £5.5/ ; 364 in. to 370 in., £5 to £5.5/ ; 384 in. to 390 in., £5 to £5.5/ ; 400 in. to 406 in., £5 to £5.5/ ; 412 in. to 418 in., £5 to £5.5/ ; 424 in. to 430 in., £5 to £5.5/ ; 440 in. to 446 in., £5 to £5.5/ ; 452 in. to 458 in., £5 to £5.5/ ; 464 in. to 470 in., £5 to £5.5/ ; 484 in. to 490 in., £5 to £5.5/ ; 500 in. to 506 in., £5 to £5.5/ ; 512 in. to 518 in., £5 to £5.5/ ; 524 in. to 530 in., £5 to £5.5/ ; 540 in. to 546 in., £5 to £5.5/ ; 552 in. to 558 in., £5 to £5.5/ ; 564 in. to 570 in., £5 to £5.5/ ; 584 in. to 590 in., £5 to £5.5/ ; 600 in. to 606 in., £5 to £5.5/ ; 612 in. to 618 in., £5 to £5.5/ ; 624 in. to 630 in., £5 to £5.5/ ; 640 in. to 646 in., £5 to

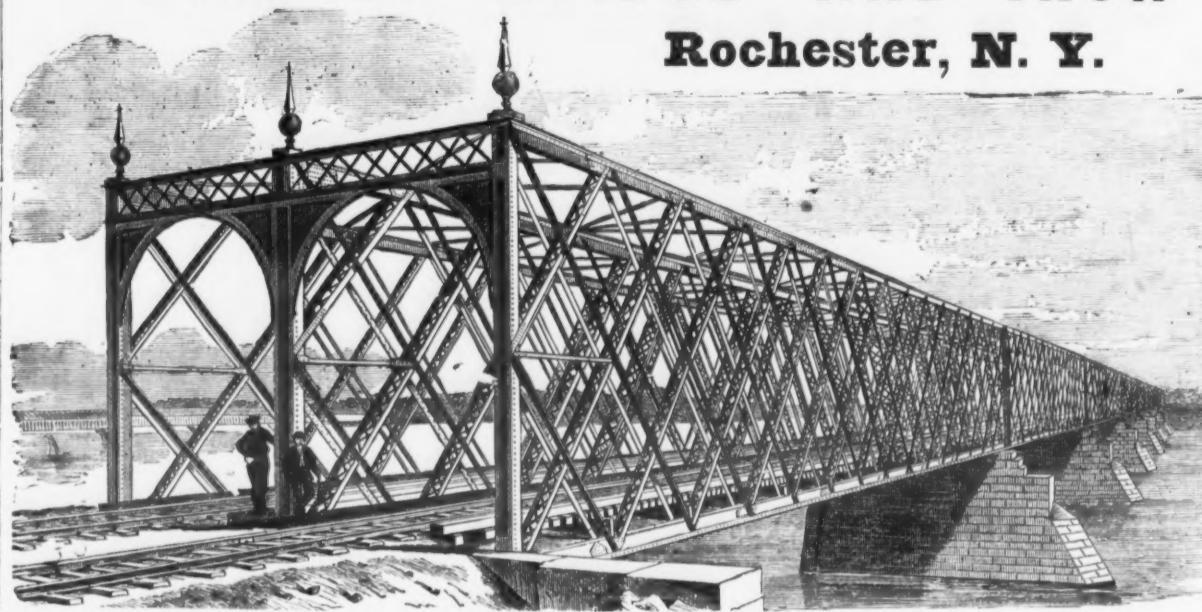
NATIONAL
Horse Nail Co.
MANUFACTURERS OF
FINISHED
(BRIGHT OR BLUED)



These nails are made of the best brands of NORWAY IRON, and are guaranteed to be equal to any in the market.

NATIONAL HORSE NAIL CO.,
VERGENNES, VT.
HORACE DURRIE & CO., Agents,
No. 97 Chambers St., New York.

LEIGHTON BRIDGE AND IRON WORKS, Rochester, N. Y.



Wrought Iron Riveted
Lattice Railroad

AND

HIGHWAY BRIDGES.

Wrought Iron

WATER PIPE.

The most economical and durable Pipe manufactured for Water Works, Oil Lines or Gas Mains.

General Riveted Work

Orders Solicited from Civil Engineers
and Contractors.

[Accompanying engraving represents the Spring-field Bridge, built by the Leighton Bridge and Iron Works.]

L. COES' Genuine Improved Patent SCREW WRENCHES.

Manufactured by

L. COES & CO.,
Worcester, Mass.



Established 1839.
In 1839.
Registered March 31, 1874.



"L. COES & CO."

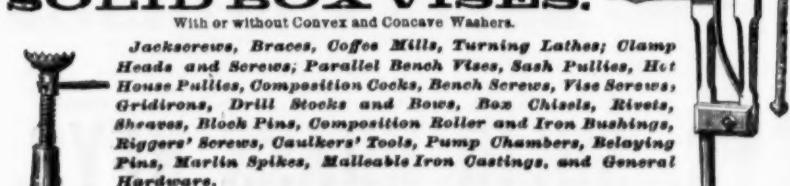
Warehouse, 97 Chambers St., & 81 Reade Sts., N. Y.
HORACE DURRIE & CO., Sole Agents.



WILSON MANUFACTURING COMPANY.,
NEW LONDON, CONN.
MANUFACTURERS OF

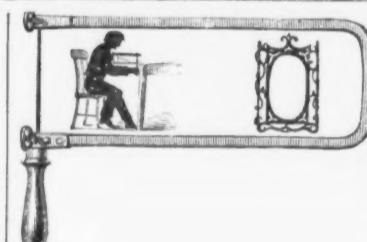
SOLID BOX VISES.

With or without Convex and Concave Washers.



GALVANIZING DONE TO ORDER.

WILSON MFG. COMPANY,
Warehouse, 97 Chambers and 81 Reade Streets, N. Y.



We wish to inform Hardware Dealers throughout the country that we are putting up for the Christmas trade, in neat paper boxes, the following articles:

One Highly Polished Spring Steel Bracket Saw Frame, with patent indestructible Clamps.

Six Saw Blades.

Fifty Designs, embracing a great variety of fancy and useful articles.

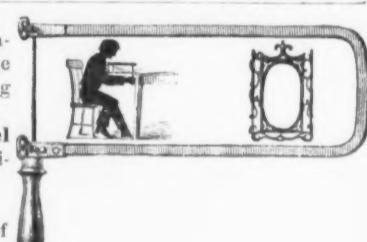
One Sheet of Impression paper, and

One Brad Awl.

With full directions for using the Saw.

List price, per Box, \$1.25.

We have advertised these goods thoroughly throughout the country, and notified all interested persons that they could buy of the dealers at our regular rates. The demand for these tools is rapidly increasing, and some of them are in use in almost every town. They will sell in every hardware store where shown.

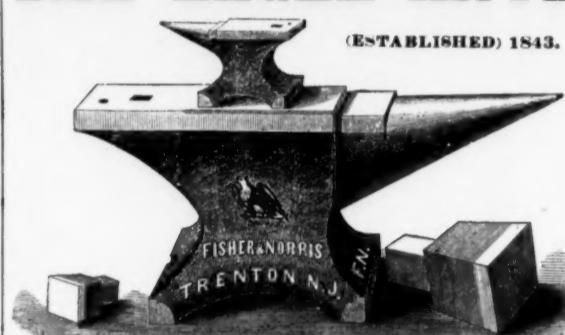


Millers Falls Company
74 Chambers Street, NEW YORK,
Corner of Broadway.

HOWARD PARALLEL BENCH VISE.
MANUFACTURED BY
Howard Iron Works,
Send for price list. Buffalo, N.Y.
RUSSELL & ERWIN MFG. CO. NEW YORK & PHILADELPHIA AGENTS.

THE EAGLE ANVIL !! WARRANTED !

(ESTABLISHED) 1843.



These Anvils are superior to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented and used only by this concern), and from the quality of the materials employed.

The best English Anvils become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought iron—causing it to "settle" under the face.

The body of the Eagle Anvil is of crystallized iron, and no settling can ever occur; the steel face, therefore, remains perfectly true. Also, it has the great advantage that being of a more solid material, and consequently with less rebound, the stroke forced receives the full effect of the hammer, instead of a part of it being wasted by the rebound of a wrought iron anvil. An equal amount of work can, therefore, be done on this Anvil with a hammer one fifth lighter than that required when using a wrought iron anvil.

The working surface is in one piece of JESUP'S BEST TOOL CAST STEEL, which, being accurately ground, is hardened and given the proper temper for the heaviest work. The horn is covered with and its extremity made entirely of steel.

The body of the Anvil is of the strongest grade of American iron, to which the cast steel face is warranted to be thoroughly welded and not to come off.

Price List, October 1st, 1876. ANVILS weighing 100 lbs. to 800 lbs., \$2. per lb.

smaller Anvils, ("Minima") 1 2 3 4 5 6 7 8 9
No. 5 lbs. 10 lbs. 20 lbs. 30 lbs. 40 lbs. 50 lbs. 60 lbs. 70 lbs. 80 lbs. 90 lbs.

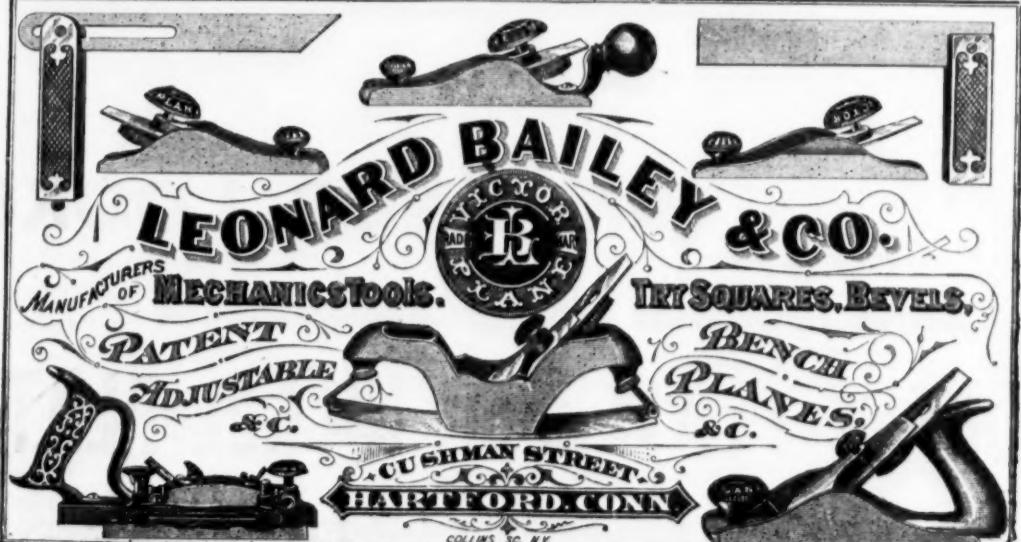
Weighing about \$2.25 \$2.75 \$3.25 \$4.00 \$4.50 \$5.25 \$6.00 \$6.50 \$7.25 \$8.00 \$8.50

N. B.—These are the RETAIL PRICES. The only additional cost will be the freight to the purchaser's place of residence.

THESE GOODS ARE SOLD BY THE GENERAL AGENTS (with special discounts to the trades.)

New York.—Messrs. J. CLARK WILSON & CO.—RUSSELL & ERWIN MFG. CO.—Messrs. HORACE DURRIE & CO., Boston.—Messrs. GEORGE H. GRAY & DANFORTH, Philadelphia.—Messrs. JAMES C. HAND & CO., Baltimore.—Mr. W. H. COLE, FISHER & NORRIS, Sole Manufacturers, Trenton, N. J.

THE VICTOR PLANES
Are the most simple, compact and practical Adjustable Planes ever offered to the public. They are made under the personal supervision of Mr. L. BAILEY, the original inventor of L. BAILEY'S PATENT ADJUSTABLE IRON PLANES. All our Planes have our Trade Mark. Send for Catalogue, embracing Planes, Try Squares, Bevels, Rules, Levels, Hammers, Mitre Boxes, etc., etc.



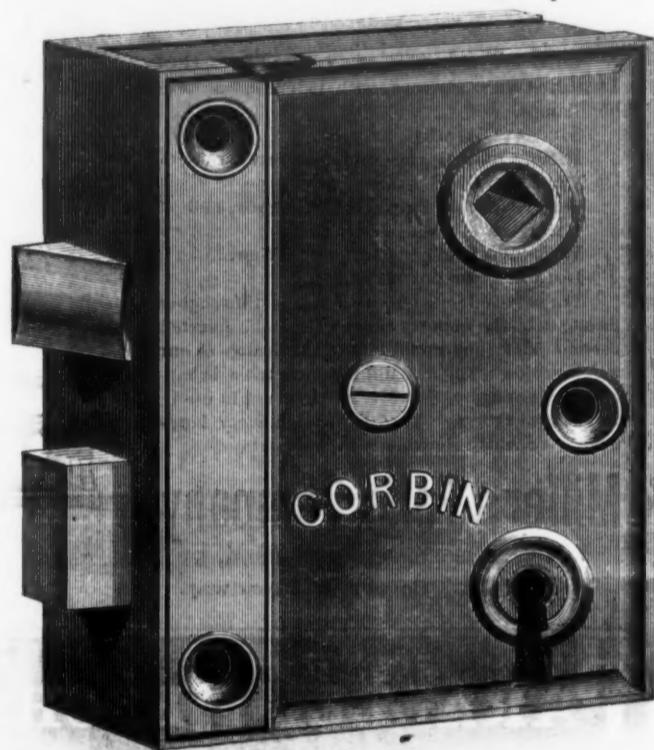
P. & F. CORBIN,

MANUFACTURERS OF

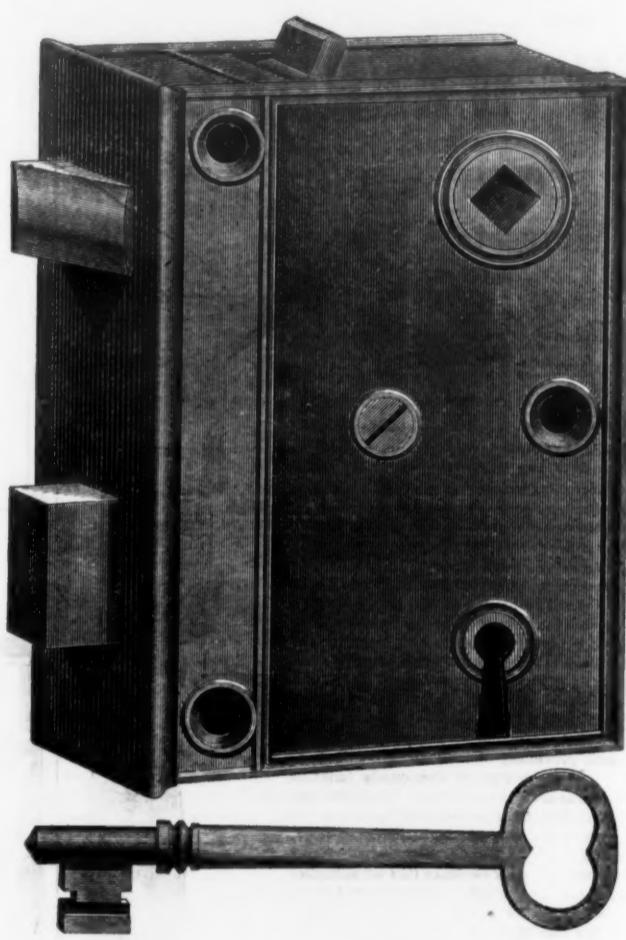
BUILDERS' AND MISCELLANEOUS HARDWARE.

Factories, NEW BRITAIN, CONNECTICUT, U. S. A.

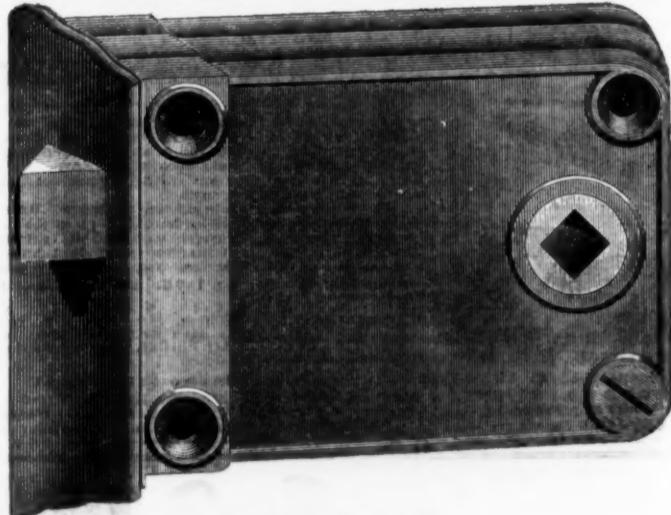
Warehouses, NEW YORK, Nos. 87 CHAMBERS and 69 READE STREETS.



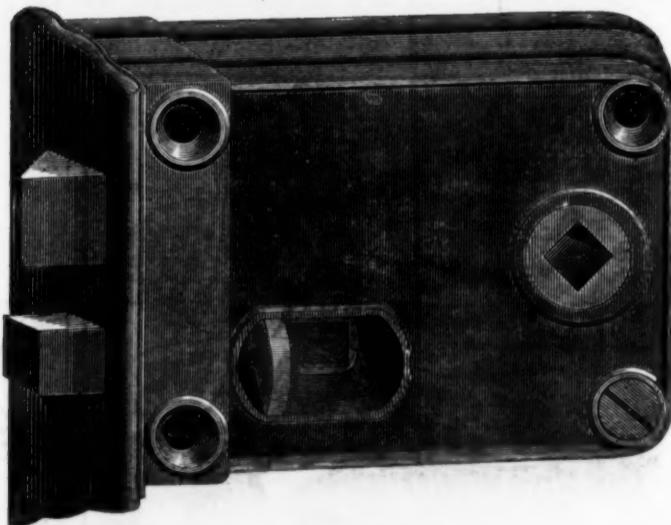
No. 465 1-2 B.



No. 962 B.



No. 301 1-2 B.



No. 302 B.

RIM KNOB LOCKS AND LATCHES.

WITH

BRASS-PLATED or NICKEL-PLATED BOLTS, SOLID BRASS KEYS.

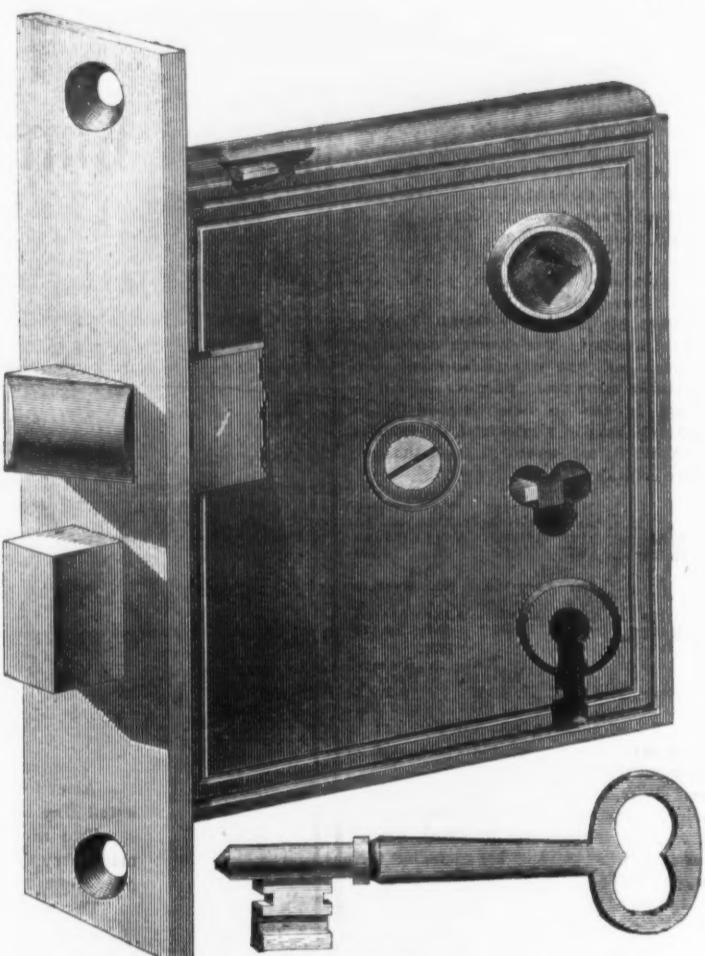
SEE LIST NEXT PAGE.

P. & F. CORBIN,

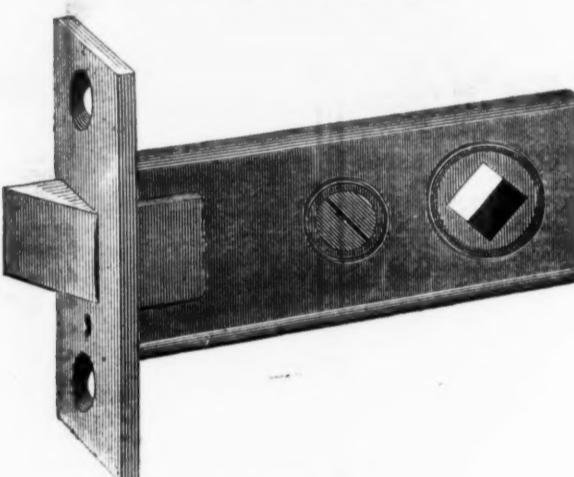
CONTINUED.

MORTISE KNOB LOCKS AND LATCHES, WITH BRASS-PLATED OR NICKEL-PLATED FRONTS AND BOLTS.

Solid Brass Keys.



No. 1171, B.B.



No. 0, B.B.

JANUS FACE UPRIGHT RIM KNOB LOCKS.

No.	Size.	Description.	Without Knobs, Per Dozen.
465 ¹ B.	4 inch.	Patent Reversible Latch, 2 Brass-Plated Bolts, Solid Brass Key	\$5.00
962 B.	4 inch.	Reversible Latch (cap off reverse), with Stop, 2 Brass-Plated Bolts, Solid Brass Key	5.25

HORIZONTAL RIM KNOB LATCH.

No.	Size.	Description.	Without Knobs, Per Dozen.
301 ¹ B.	3 inch.	Brass-Plated Bolt	\$4.00
302 B.	3 inch.	Brass-Plated Bolts with Slide Bolt	5.00

Above furnished with NICKEL-PLATED BOLTS, to order, at same list.

MORTISE KNOB LOCKS.

No.	Size.	Description.	Without Knobs, Per Dozen.
1171 B.B.	3 ¹ / ₂ inch.	Patent Reversible Latch, Brass-Plated, Front Strike and Bolts, Solid Brass Key	\$5.75
1191 B.B.	4 inch.	Patent Reversible Latch, Brass-Plated, Front Strike and Bolts, Solid Brass Key	6.50

MORTISE KNOB LATCH.

No.	Size.	Description.	Without Knobs, Per Dozen.
0 B.B.	3 ¹ / ₂ inch.	Brass-Plated Front, Strike and Bolt	\$3.50

Above furnished with NICKEL-PLATED FRONTS AND BOLTS, to order, at same list.

Discount on all the above, same as corresponding Locks, with regular finish.

We would also call attention to our large and constantly increasing variety of **LOCKS, LATCHES, HINGES, AND BUILDERS' HARDWARE** generally. Supplementary Sheets to our Illustrated Catalogue will be forwarded to those having copies of our catalogue the present week.

Failures in 1876.

The mercantile agency of Dun, Barlow & Co., have just issued their annual statement of failures in the United States and Canada. It appears that the amount of failures in the United States, in 1876, was \$191,117,786, against \$201,660,353 in 1875. The amount is certainly extraordinarily large; but the fact that it is less than in the preceding year by \$10,000,000, and that the number of suspensions occurring in the last quarter of the year shows marked decrease, indicates that we are at last getting over the worst effects of the panic upon credits. The number and the money amount of failures occurring in the United States and in Canada for the last five years have been as follows:

	United States.	Canada.
1876.	\$191,117,786	\$35,517,000
1875.	201,660,353	38,845,000
1874.	155,239,000	7,696,000
1873.	928,492,000	14,334,000
1872.	131,065,000	...

The failures in Canada for the two last years are much larger, *pro rata* to population, than in the United States. In 1876, the failures in the United States averaged \$4,244,000 to every million of population; while in Canada the rate was \$6,379,000 to each million; and in 1875 the proportion was in about the same ratio. If the same had prevailed in this country as in Canada, the failures of last year would have amounted to \$287,000,000, or \$96,000,000 above the actual amount. The average amount of indebtedness last year in each failure is much lower than for many years previous, as will be illustrated by the following statement, in which, for the sake of comparison, the failures in New York city are separated from those of the entire country:

	1876.	1875.		
No. of Average fall's. of fail's.	No. of Average fall's. of fail's.	No. of Average fall's. of fail's.		
United States....	9,094	\$21,020	7,740	\$35,960
New York City....	887	37,479	951	51,789
1874.	...	...	...	...
No. of Average fall's. of fail's.	No. of Average fall's. of fail's.	No. of Average fall's. of fail's.		
United States....	5,830	\$26,027	5,181	\$44,085
New York City....	645	30,510	644	143,643
1873.	...	...	...	...
No. of Average fall's. of fail's.	No. of Average fall's. of fail's.	No. of Average fall's. of fail's.		
United States....	4,069	\$39,996	385	\$3,734
New York City....	...	...	...	...

We quote the following from the circular:

"It may be interesting to discover in what sections of country the financial pressure has been the most severe, and with that view the following table is presented. Under the head of 1876 the number of columns are amplified, which want of space prevents in other years, but the figures, as a whole, will be sufficient to form a basis for comparison:

	No. in No. of Per cent. of Amount Averg. bus'n's. fall's. of fail's. of fail's.	1876.	1875.	
N. E. States....	77,359	1,314	1 in 59	
Mid. States....	165,184	2,009	1 in 57	
West. States....	225,309	3,129	1 in 73	
S.th. States....	87,140	1,361	1 in 64	
Pac. States....	92,318	369	1 in 60	
Canada....	54,000	1,728	1 in 33	
			25,517,991	
			14,261	
			14,767	
			1872.	
No. of Amount fall's. of fail's.	No. of Amount fall's. of fail's.	No. of Amount fall's. of fail's.	No. of Amount fall's. of fail's.	
N. E. States....	1,335	\$40,415,164	789	\$10,000,000
Mid. States....	2,248	\$58,545,346	2,028	\$25,061,000
West. States....	1,939	\$34,948,354	1,744	\$33,073,000
South. States....	1,333	\$8,277,777	1,186	\$0,090,000
Pacific States....	377	2,595,610
Canada....	1,988	\$9,843,987	966	7,695,765
			1873.	
No. of Amount fall's. of fail's.	No. of Amount fall's. of fail's.	No. of Amount fall's. of fail's.	No. of Amount fall's. of fail's.	
N. E. States....	598	\$39,550,000	620	\$40,671,000
Mid. States....	1,914	140,946,000	1,399	40,784,000
West. States....	1,619	36,040,000	1,148	27,891,000
South. States....	917	19,085,000	807	19,060,000
Pacific States....	944	12,334,192

"An examination of the above table confirms the impression which has been very general, that trade in the Western and Southern States has been less disastrous than that of the Eastern and Middle States. It is a significant circumstance that the failures in the Middle States are one in every 57 names reported in business, while in the Western States the proportion is one in every 72; but the comparison between the East and the South is even more significant, for in New England, with all its wealth and solidity, one in every 39 has yielded to the pressure of the times, while in the South, with all its poverty, its political and other disabilities, the percentage of failures is only one in every 64. Even in Canada, where there is a gold basis, light taxation, freedom from political complications, and all other favoring conditions, the above showing is indicative of much greater pressure than in the United States, the failures in the Dominion being one in every 32. In England no very accurate figures are obtainable, and none of course as yet for the past year, but for 1875 a return was made of 1700 failures among 60,000 firms prominent in trade, indicating one failure for every 36 firms reported in business, with an average liability of \$87,870. The figures for the United States, showing a failure of one in every 63, with an average liability of \$21,000, indicate that the pressure of the times has been either not so great in this country as elsewhere, or that it has been borne with less disastrous results."

Of the failures of the year in Great Britain *Reyland's Iron Trade Circular* says:

"A writer possessing something of a statistical turn of mind has been at the trouble to sum up the mercantile failures in the United Kingdom during the past year. The list is rather appalling, since there were no fewer than 265 failures in the different branches of trade—financial, wholesale and manufacturing." By far the larger proportion of these represent engineers, founders, iron, metal and hardware manufacturers and merchants, and the number of failed firms in this category, we observe, is considerably in excess of any previous year since 1872. The figures during the last five years show the number of failures to be as follows, namely: 1872, 1326; 1873, 1745; 1874, 1751; 1875, 1736; and 1876, 2005. Dealing exclusively with the latter year we find London claiming 557; Liverpool, 87; Manchester, 128; Lancashire, 90; Yorkshire (excluding Middlebrough and Hull), 287; Birmingham and Midland iron district, 182; Newcastle, Middlesbrough, Hull and district, 86; Bristol, Cardiff, Newport and Swansea, 90; rest of England, 379; Scotland, 132; Ireland, 37. These results exhibit unmistakable evidence of diminished production and keener competition in almost every branch of manufacture, but more especially in the iron and metallurgical industries."

AMERICAN SCREW CO., Providence, R. I.

Manufacturers of

IMPROVED Gimlet Pointed Wood Screws, Patented

May 30,

1876.

TRADE MARK.

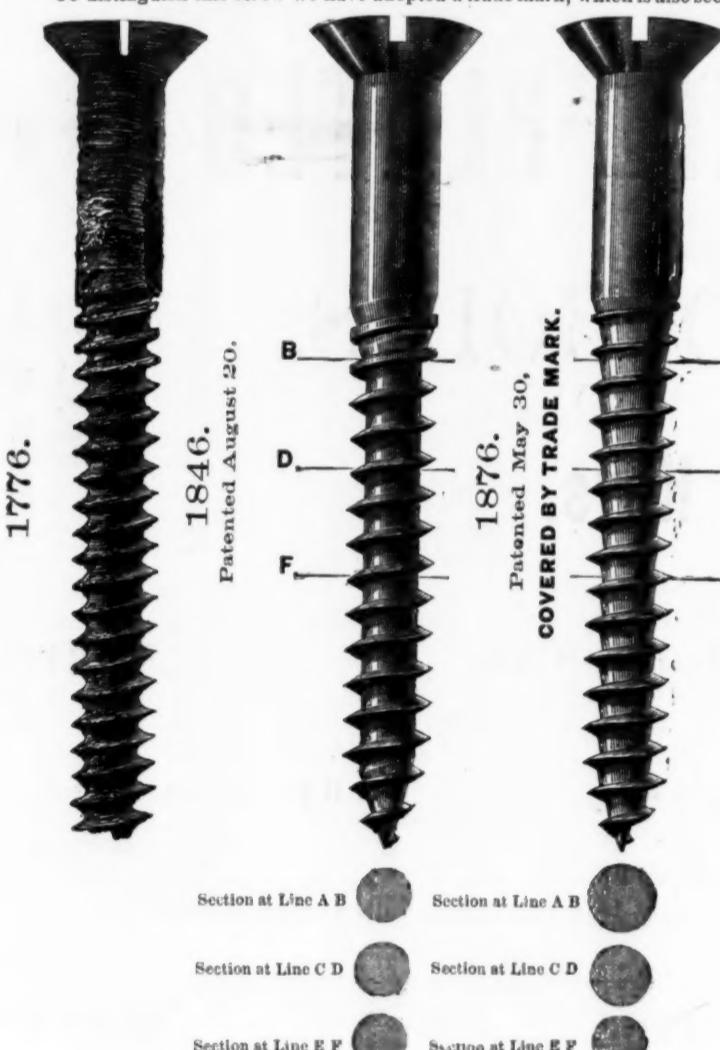


After forty years' experience we offer to the trade our **Centennial Screw**, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the **improved** article only. To introduce them, they will be sold at same price as the old style screw.

The new screws will be packed in manila colored boxes with new label covering end of box, and **enlarged figures** showing plainly contents.

To distinguish this screw we have adopted a trade mark, which is also secured to us.

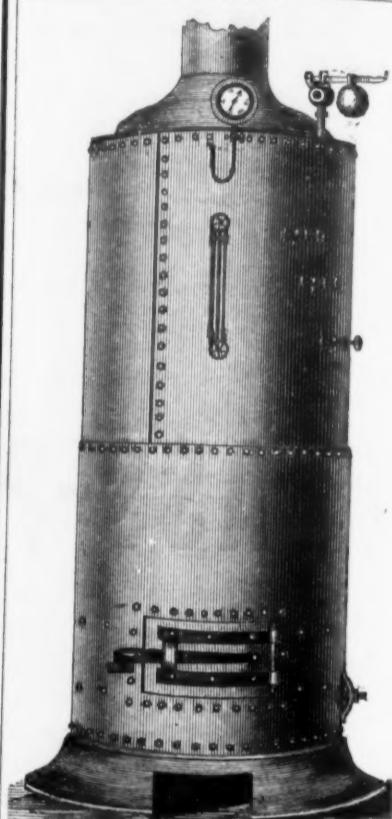


1876.
Patented August 20.

1876.
Patented May 30.
COVERED BY TRADE MARK.

Estimated to be FIFTY PER CENT. stronger than a screw commonly made.

Improvement in Rerolling Rails.—The Youngstown Tribune has the following interesting item: About four years ago Mr. John H. Jones, of this city (Youngstown), obtained a patent that is destined to become of great importance in the manufacture of rails. Owing to lack of capital, the introduction of this has been slow, but at last the necessary rolls have been completed, and on Thursday, 25th, they were carefully tested at the Girard Rolling Mill. There were present a large number of practical iron men and workers, and the admiration with which they viewed the test is the best evidence of its success. It was found that these rolls will bring a worn out rail back to its original size or reduce it to a smaller size for narrow gauge or mining purposes. This was done without changing the properties of the rail from its original construction. In the test an old rail of 50 pounds to the yard was reduced to 12 pounds to the yard, in one heat, with perfect ease. It is claimed that by adopting the same principle in the construction of rolls a steel rail can be rolled into a billet for any purpose without leaving a crease in it. Mr. Jones proposes soon to give another test of his rolls when all interested in the improvement will be invited.



LOVEGROVE & CO.,
125 N. 4th St., Philadelphia, Pa.
Manufacturers of

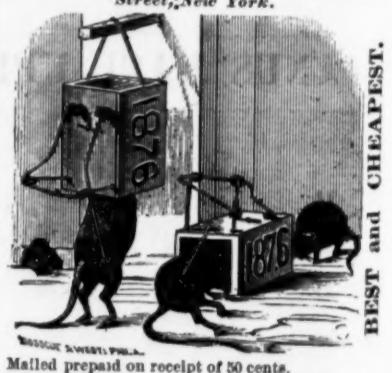
Boilers & Engines,
All styles and sizes.

Dealers in Steam Pumps, Machinery, Wrought Iron Pipes, Valves, Fittings, Engineers', Miners' and Railway Supplies.
See for price list, Medal and Premium awarded at the Centennial Exhibition.

**1876.
ANIMAL TRAPS**

Made by

THE SELLERS MFG. CO.,
707 Market Street, Philadelphia, 83 Reade Street, New York.



CLOTHES WRINGER!



T. J. ALEXANDER, Manager,
BOSTON, MASS.

GEORGE W. BRUCE,
No. 1 Plant St., New York,
Agent for CLEMENT & MAYNARD,
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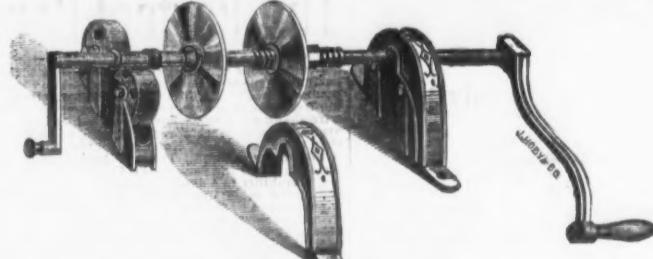
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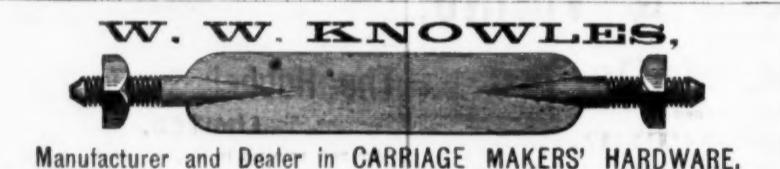
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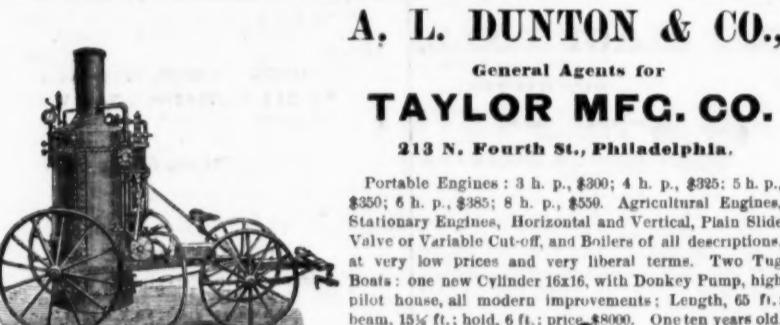
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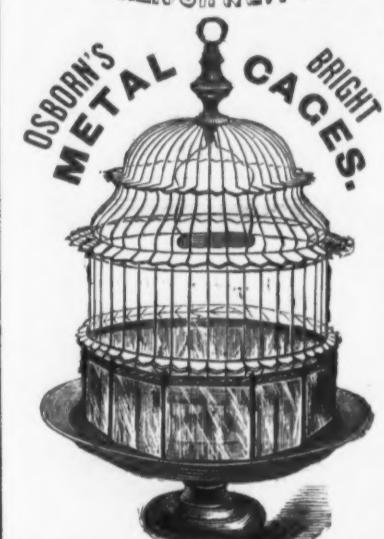
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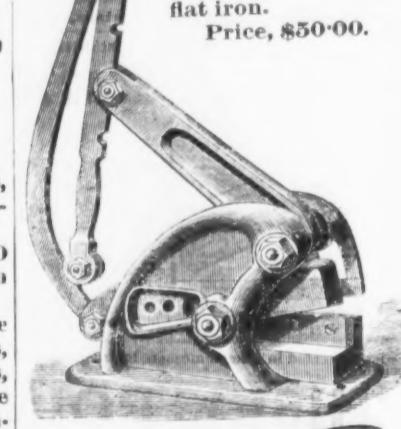
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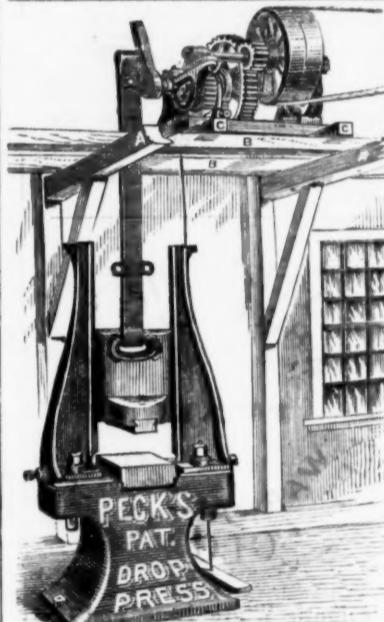


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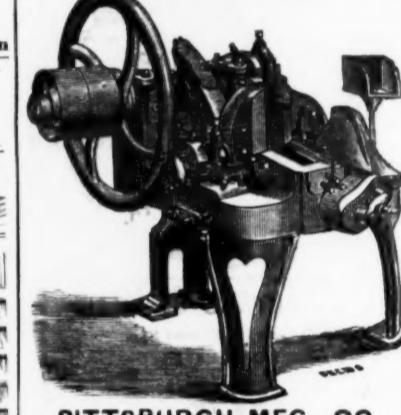
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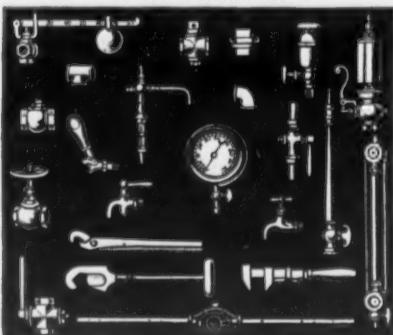
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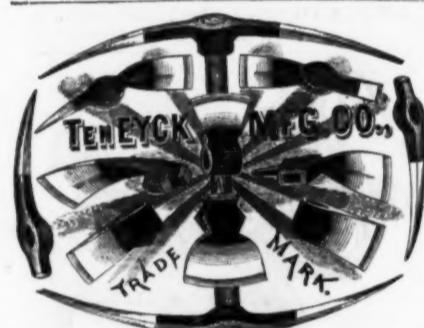
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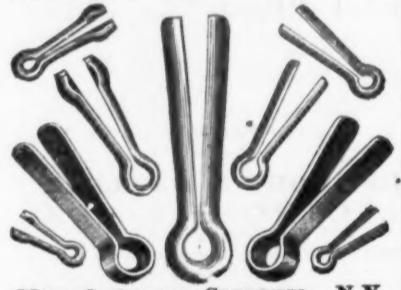
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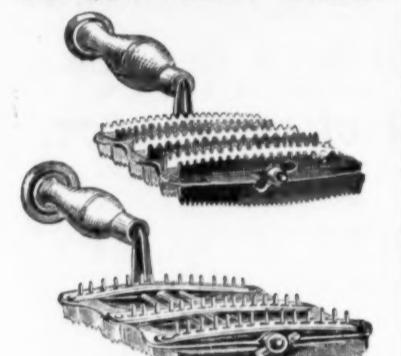
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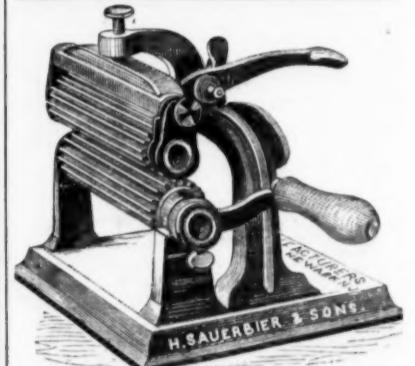
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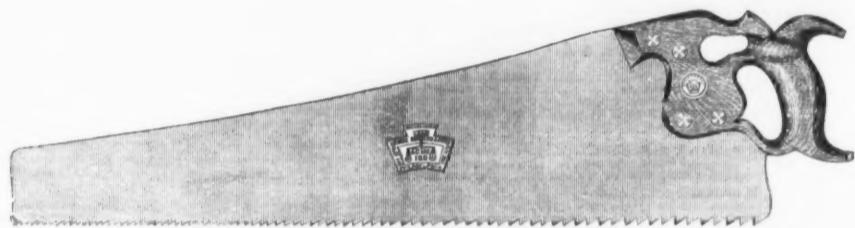
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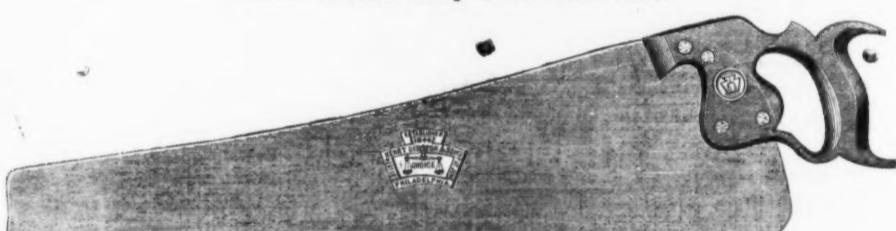
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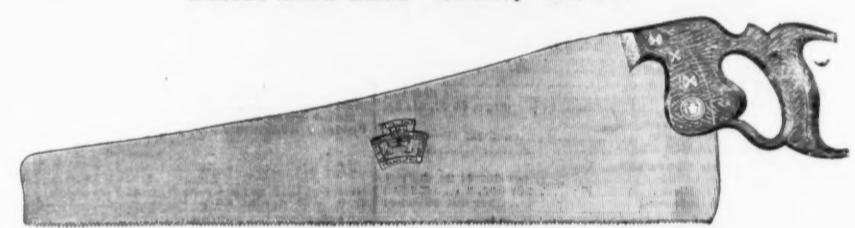
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Patent Double Grip Skew Back Saw.



Patent Skew Back "Choice," No. 80.



Patent Skew Back, No. 76.



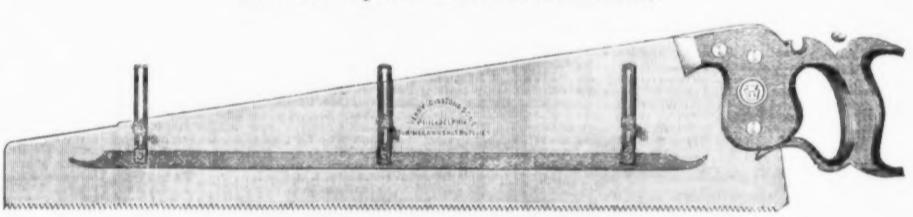
No. 7 Hand Saw.



Beveled Back Turning and Felloe Web.



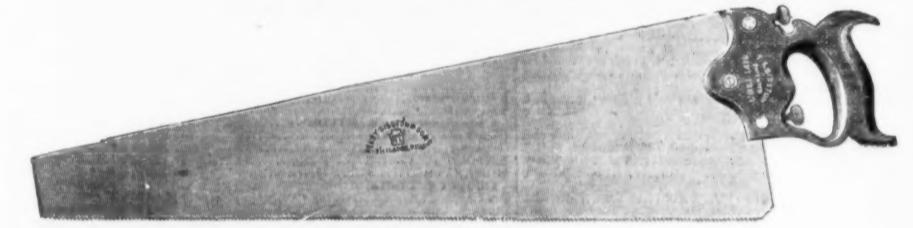
Patent Improved Combination Saw.



Patent Gauge Saw, Quality No. 7.

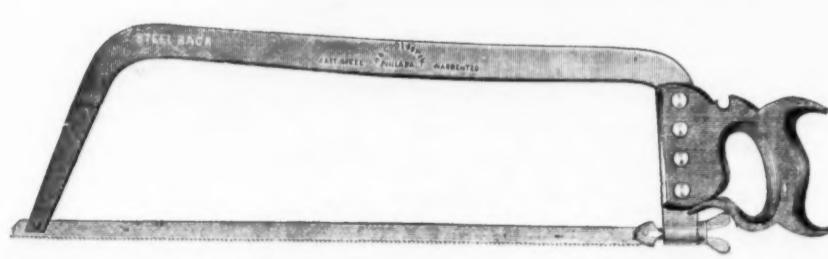


Patent Combination Saw, No. 29.



Hand Saw with Patent Adjustable Handle.

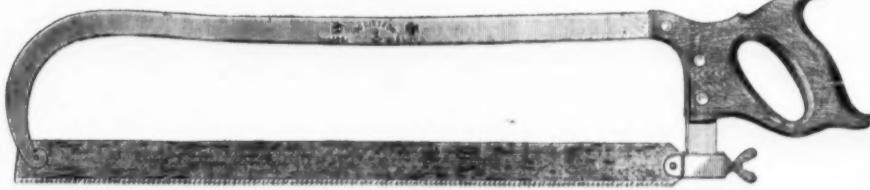
BUTCHERS' BOW BACK SAWS.



No. 1, California Flat Steel Back, Clock Spring Blades.



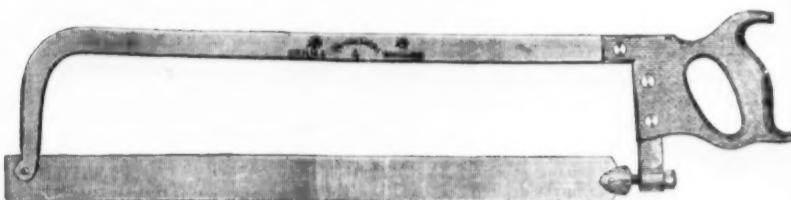
Pork Packers' Saws. Sizes, 14 to 18 inches.



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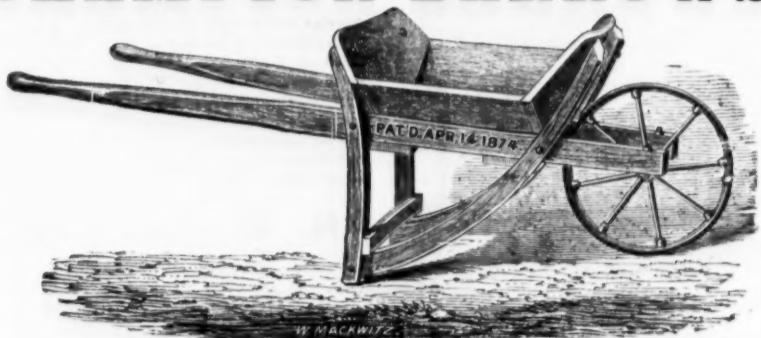
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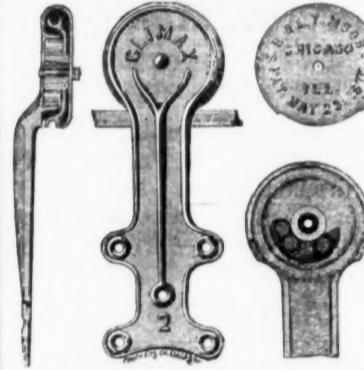
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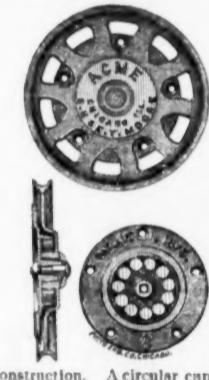


The "CLIMAX" Hanger is simple and substantial in its construction. A circular cap on the head contains a set of nine chilled iron rollers, around which the hub of the wheel revolves. The rollers do away with the friction and wear on a center pin which is the objection to the common wheel hangers. In the "Climax" there is the friction of rolling surfaces only. Other hangers have the wheel alone, or the rollers alone; the combination of both in the Climax makes it the easiest running hanger in existence.

The "ACME" Roller is made on the same principle as the "Climax" Hanger. All the parts are constructed in the strongest manner and turned in a lathe to work perfectly true and smooth. It is adapted to a track made of $\frac{1}{2}$ inch half round iron.

"ACME"

Barn Door Rollers.

The "ACME" Roller is made on the same principle as the "Climax" Hanger. All the parts are constructed in the strongest manner and turned in a lathe to work perfectly true and smooth. It is adapted to a track made of $\frac{1}{2}$ inch half round iron.The "ACME" Roller is made on the same principle as the "Climax" Hanger. All the parts are constructed in the strongest manner and turned in a lathe to work perfectly true and smooth. It is adapted to a track made of $\frac{1}{2}$ inch half round iron.The "ACME" Roller is made on the same principle as the "Climax" Hanger. All the parts are constructed in the strongest manner and turned in a lathe to work perfectly true and smooth. It is adapted to a track made of $\frac{1}{2}$ inch half round iron.The "ACME" Roller is made on the same principle as the "Climax" Hanger. All the parts are constructed in the strongest manner and turned in a lathe to work perfectly true and smooth. 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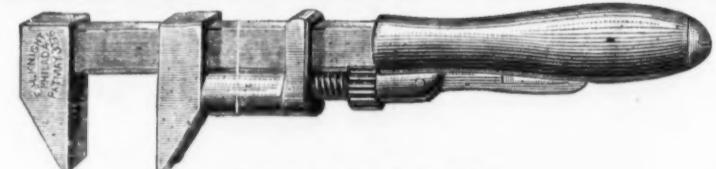
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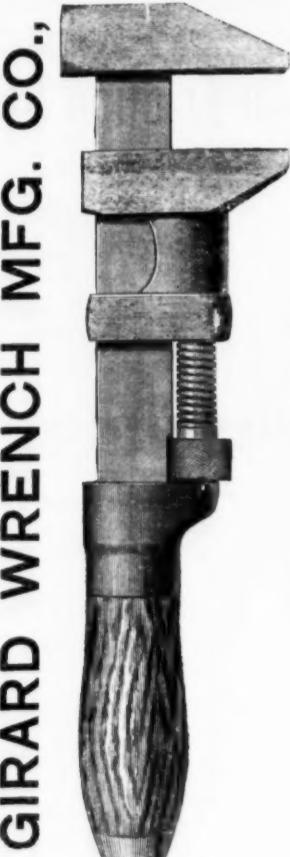
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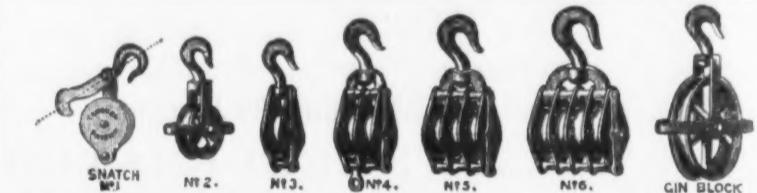
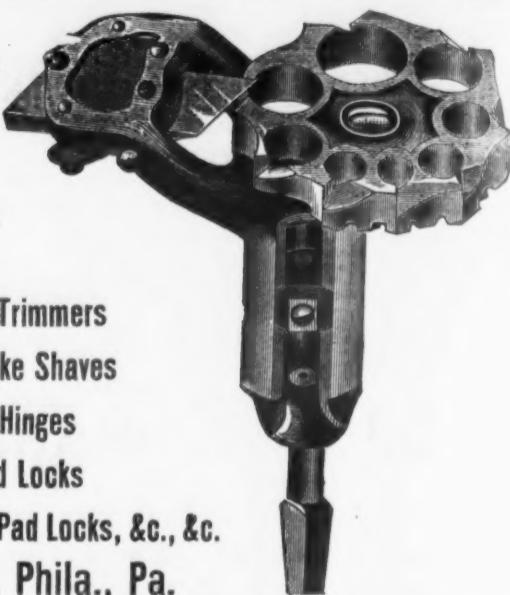
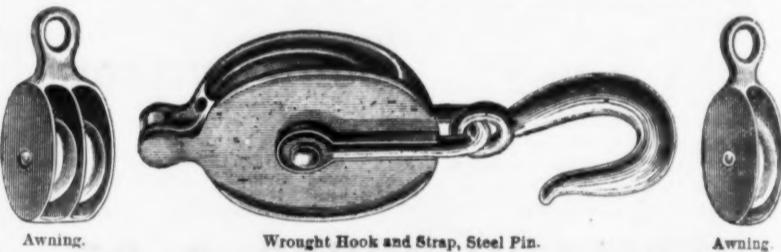
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Double Edge Sooke Shaves
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FOR ROPE OR CHAIN.All sizes constantly on hand for Rope from $\frac{1}{2}$ in. to $2\frac{1}{2}$ in. diam., and for Chain 3-16 to $\frac{1}{4}$ in. diam.

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Patent Galvanized Malleable Iron Blocks.

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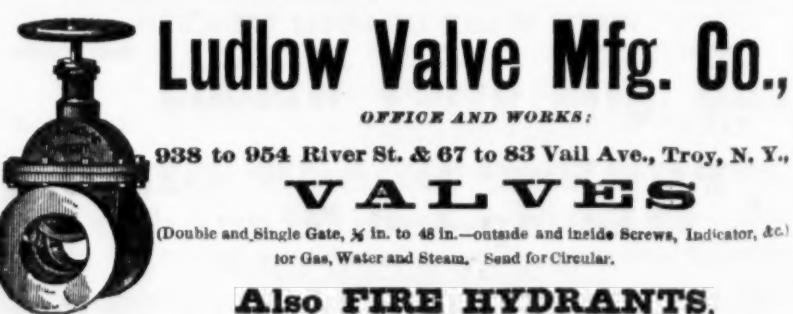
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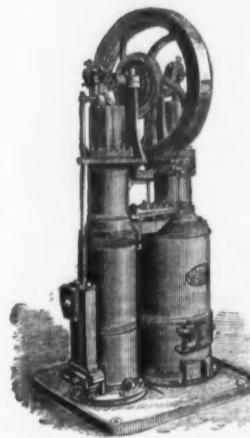
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THE RIDER COMPRESSION PUMPING ENGINE.



NO BOILER,
NO STEAM,
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Uses air as a Motive Power.
VALVELESS, NOISELESS,
Requires no Skilled Engineer.

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Sizes from 2 to 15 H. P., which include Engine, Boiler and Furnace, Pump and Governor, Gauge Cocks, Safety Valves, &c., &c., &c., and is ready to run two hours after its arrival at its destination, occupies less space, and consumes less fuel than any other Engine of same Power.

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Malleable Iron Castings made to order.

HYDRAULIC JACKS

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For
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We invite attention
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Its working parts are
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strong, compact and
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the greatest variety of
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Patented Furnace Charging Scale.
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Bellows Factory and
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ESTABLISHED 1852.

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Cisterns, Stairs, Hand Rails, Newels, Mirror
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Non-Extensible Razor Belt.

PATENTED JULY 25, 1871.

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In this Strap the liability of the leather to stretch and become loose and porous is prevented by the use of a patented non-extensible base, which supports the leather and secures

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We make this style with single rod, double rod, and wood frames, and intend that it shall, in quality

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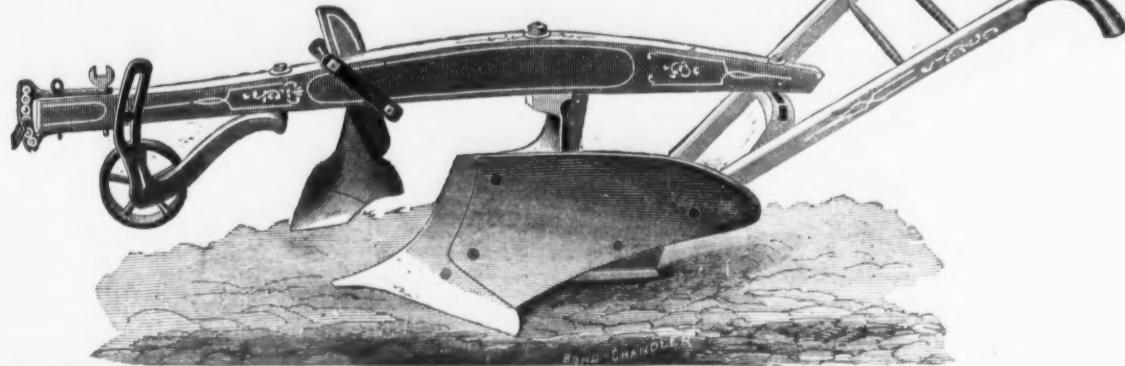
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These implements, though but four years before the public in their present form, show the following remarkable record :
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The sales for 1876, will undoubtedly exceed 60,000 Plows. For full descriptive circulars, address

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Made of JESSOP'S BEST CAST STEEL, and warranted superior to any other

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Capacities from 1 to 100 tons.

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MANUFACTURERS OF
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(PATENT APPLIED FOR.)

In presenting to your notice our **ULSTER SLED**, we introduce an article that has long been needed in the trade, viz., a light, yet strong and durable sled. This has been accomplished, as the entire running gear, runners and cross-bars, are formed by a single piece of metal. The hopes and efforts of the inventors and manufacturers of our country have been directed toward reaching, in this our Centennial year, perfection in their respective productions, and we now leave it to the public and their children to decide whether we have been successful or not.

Very truly,

CROSBY GILZINGER & CO. Manufacturers RONDOUT, N. Y.

The Famous Improved

SHEPARDSON LOCKS

Are the "Best" in the World.

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Automatic Car Coupler.

Adopted on many of the leading railways, and approved wherever used.

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For particulars address the Patentee,

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Horse Drawn.—Horse Drawn, \$ 10 00

Horse Drawn.—Horse Drawn, \$ 1

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It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what a good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying our Governor, are requested to stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do.

Reduced Price List,

FEBRUARY 1, 1877.

For dimensions of Governor, see Illustrated Price List.



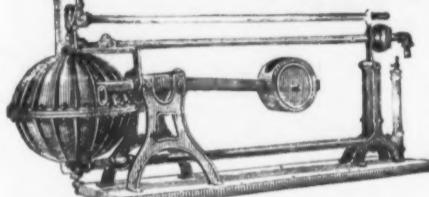
THE JUDSON PATENT

Improved Steam Governor.

No Charge for Boxing & Cartage.

JUNIUS JUDSON & SON, Rochester, N. Y.

The Albany Steam Trap.

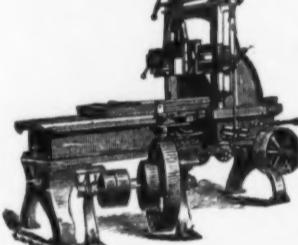


This Trap automatically drains the water of condensation from *Heating Coils*, and returns the same to the Boiler whether the Coils are *above or below* the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

Albany Steam Trap Company,
Albany, N. Y.

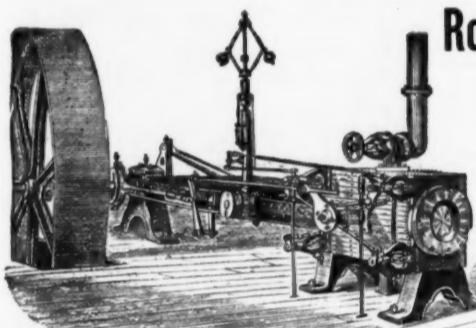
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Have constantly on hand and making



Drop Hammers

Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.



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CHESTER, PA.
Corliss Engine
BUILDERS.
Shafting & Gearing,
Boiler Makers.

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PORTABLE DRILLS. Driven by power in any direction.
RADIAL DRILLS. Self-feed—Large Adjustable Box Table.
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MULTIPLE DRILLS. 3 to 20 Spindles.
HORIZONTAL BORING AND DRILLING MACHINES.
HAND DRILLS. CAR BOX DRILLS.
SPECIAL DRILLS. For Special Work.

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Small Lathes for Steam or Foot Power. Designs and Drawings for Patent Office. Several Valuable Patents for sale.

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BRADLEY'S Cushioned Herve Hammer

Has Won Golden Opinions from the Mechanical World during the four years it has been before the public, and has reached a sale of 300 Hammers, all in successful operation, in this and foreign countries.
It Has More Good Points, Less Complication, More Adaptability, Larger Capacity, Does More and Better Work, Takes Less Power, Costs less for Repairs than any Hammer in the World. GUARANTEED AS REPRESENTED, and "DON'T YOU FORGET IT."

Established 1832

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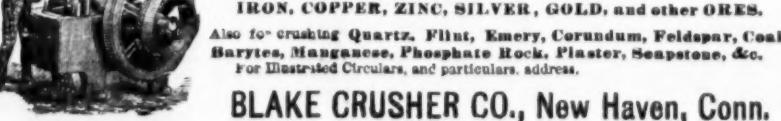
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New Pattern with Important Improvements & Abundant Strength

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Reduced Price List,

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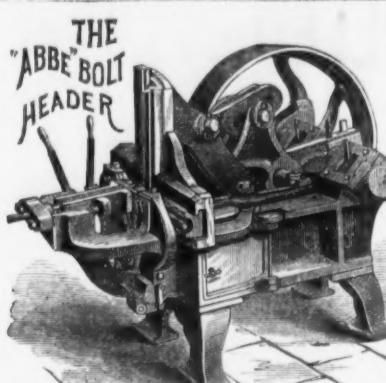
Size, Inch.	Plain.	Bright Fin- ished.	Extra for Spe'd'r	Stop Valve.
1 1/8	\$16.00	\$18.00	\$1.90	..
1 1/2	18.00	20.00	1.90	..
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2	22.00	24.00	2.25	..
2 1/2	26.00	30.00	2.50	8.00
3	31.00	35.00	2.75	10.80
3 1/2	36.00	41.00	3.25	12.00
4	40.00	45.00	3.50	14.00
4 1/2	45.00	51.00	3.75	16.00
5	50.00	57.00	4.00	18.00
5 1/2	59.00	67.00	4.25	22.00
6	65.00	73.00	5.00	28.00
6 1/2	70.00	79.00	5.50	34.00
7	79.00	101.00	6.00	40.00
7 1/2	105.00	117.00	6.50	46.00
8	120.00	133.00	7.00	54.00
8 1/2	142.00	156.00	8.00	65.00
9	175.00	192.00	9.00	79.00
9 1/2	198.00	218.00	10.00	..
10	210.00	240.00	12.00	..

No Charge for Boxing & Cartage.

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THE PALMER POWER SPRING HAMMER.



"ABBE" BOLT
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Of these Machines we are building sizes to meet the requirements of all Manufacturers and Workers of Iron and Steel. In simplicity, durability, ease of operation, accuracy, and range of work, we guarantee them superior to any Machines of their kind produced in the world. For prices, references, and full descriptive circulars, address

S. C. FORSAITH & CO.,
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Knowles Patent Steam Pumps

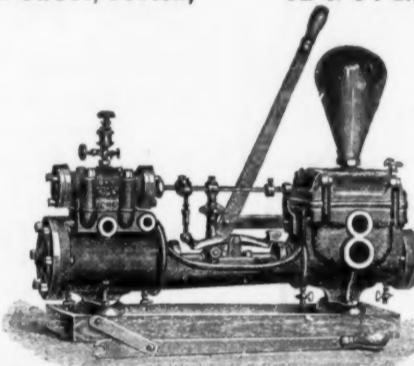
MANUFACTURED BY THE

KNOWLES STEAM PUMP WORKS,
WARREN, MASS.

WAREHOUSES:

14 & 16 Federal Street, Boston,

92 & 94 Liberty Street, N. Y.



Cut above represents regular Boiler Feed Pump, No. 3 and 4. Showing New Patent Valve Motion, and Hand Power LEVER Attached and Detached.

FIRE PUMPS a specialty.

Mining Pumps (both Double Acting Plunger, and Piston Pattern,) which we guarantee to run absolutely noiseless on any lift from 100 to 600 ft., at a single lift, a specialty. Pumps for every possible duty. Prices as low as any, and our workmanship and material altogether the Best.

Every machine furnished under a complete guarantee.

A. H. MERRIMAN,
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Punching Presses.

Patentee and Sole Manufacturer.

I warrant every part of this Machine to stand the shock of the wheel running at 125 revolutions.

West Meriden, Conn.

Machinery Hall, Philadelphia, Section B 4, Columns 28 and 29.

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To 125 North 4th Street,

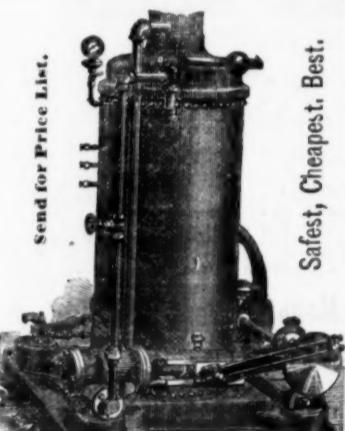
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Manufacturers of

BOILERS & ENGINES.

Send for Price Lists.

All Styles and Sizes on hand, and made to order.



The Whitmore Engine.

Safest, Cheapest, Best.

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Manufacturers of all kinds of

Celluloid Emery Wheel Co.,

Manufacturers of all kinds of

Celluloid Emery & Corundum Wheels

FOR DENTAL AND MANUFACTURING PURPOSES.

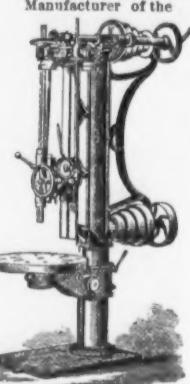
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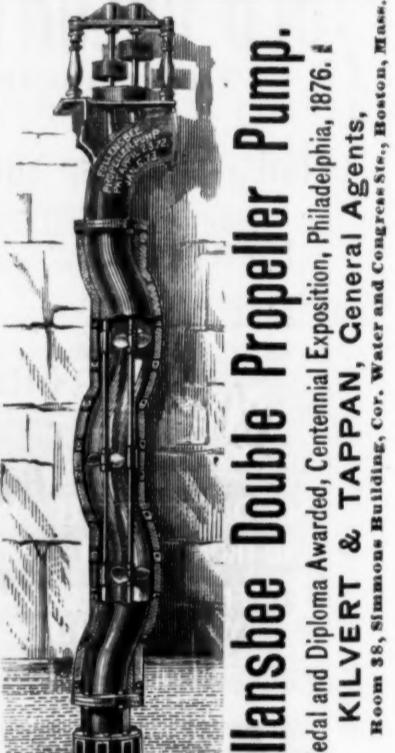
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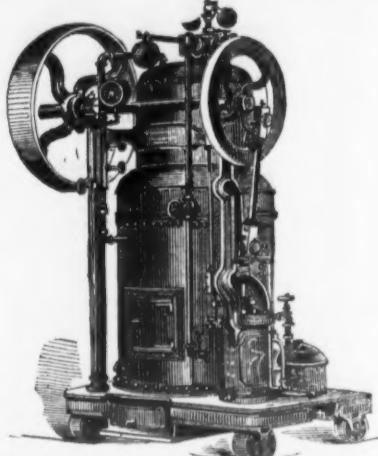
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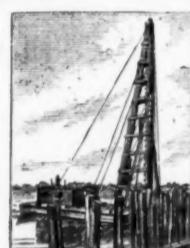
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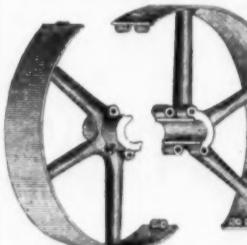
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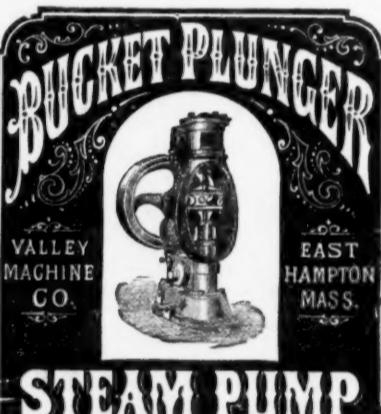
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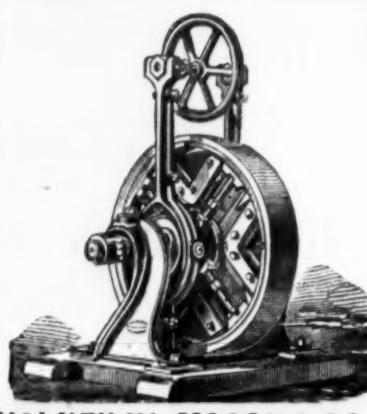
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